Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York

All communications should be addressed to the New York office, 30 Church Street, or to the Chicago office, 105 West Adams Street

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States and Mexico, $6.00; Canada, including duty, $8.00. Foreign countries, not including daily editions, $8.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office

Vol. 92 March 19, 1932 No. 12

In This Issue

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

Cutting Transportation Costs . . . . .

Centralized Traffic Control on the Santa Fe

Train movements regulated on section of busy single-track

New type of plant signals engineering

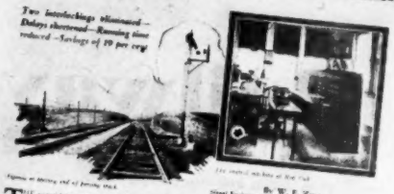
Definite data on power requirements

By G. K. Thomas

Burlington Completes Centralized Traffic Control on 24 Miles of Single Track

Two interlockings eliminated—Delays shortened—Running time reduced—Savings of 10 per cent

By W. F. Zinn



Railway Signaling

July, 1930

Centralized Traffic Control on 40 Miles of the Southern Pacific

Estimated expense of $2,500,000 for second track deferred by increased prices of power facilities

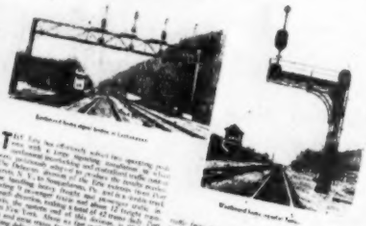
Characteristics of the Line

Southern Pacific Installs Centralized Control on Section of Busy Single-Track Line

Train movements directed by the signal indications

Erie Increases Track Capacity on Busy Section of Double Track

New mechanical plant and centralized traffic control installation solve problem



The Solution

Signal Indications Direct Trains on the Paducah & Illinois

Entire railroad, including five junctions and bridge over the Ohio river, installed in dispatcher-controlled system

By J. H. Schubert

Pennsylvania Installs Centralized Control on 30.3 Miles of Single Track

Twelve minutes saved on each freight train stop—Second tracking deferred

First installation of Union three-wire coded system

Characteristics of Line and Traffic

The Control Machine

Track and signal plan, indicating grades, for

Code Line Circuit

Removal of Second Track

On not a few sections of double track the present traffic, as well as any increase that may reasonably be expected, can be handled economically on one track, thereby permitting the removal of the second track and effecting substantial savings in track maintenance. Aside from changes in traffic conditions, developments in railroading during the last decade have contributed to a marked increase in track capacity. Among these, as a result of better track conditions and larger locomotives, more cars are being handled in each train, thus reducing the number of trains. Also, higher speeds result in a train clearing the line quicker. With centralized traffic control, including power-operated switches, numerous delays and train stops are eliminated, again contributing to an increase in the average speed. All of these developments are serving to increase the capacity of a single-track line.

The idea of taking up a second track is not new. During the World war short sections were torn up on the railways in Ireland to permit the rails and fastenings to be shipped to the war zone in France. After the close of the war, it was found that with proper signaling for directing train movements, such satisfactory operation was obtained that further sections of second track were taken up, totaling some 220 miles at the close of 1930.

The idea of removing second track is now gaining attention in America. At least one road has made studies to this end and the Committee on Economics of Railway Operation of the A. R. E. A. has presented a report setting forth in detail the factors involved in determining the advisability of removing a second track on 24.6 miles of line, the study being based on actual conditions investigated on a certain railroad. In brief, the net saving was determined to be $30,096 annually from a cash expenditure of $52,870, a 57 per cent return. There is, however, one factor that may appear as an obstacle; namely, the fact that the retirement chargeable to the profit and loss account, as an operating expense, is $449,110. Of course, if the track is merely taken out of service temporarily, it is possible to defer this charge until it can be taken into the accounts more conveniently.

The conclusion of the report is that "where the volume of traffic on a double-track line has decreased enough to warrant a reduction in facilities, the converting of double track into single track should be considered." It would most certainly have been of interest if the committee had gone one step further and investigated the conditions which would prevail with an increase of traffic. In other words, if a railroad is to remove a section of second track there should be some assurance that not only the present traffic but also a reasonable increase can be handled efficiently on the remaining single track. Prior to the construction of several of the large installations of centralized traffic control now in service, time-distance charts were prepared to show the then-existing and the proposed methods of operation of trains. The forecasts as to the time saving and increased track capacity have been quite accurate. The data brought out by the committee, together with a study of time distance charts should, therefore, form a basis on which any railroad can make an investigation as to the practicability of removing a second track.

Earnings and Purchases

There is, of course, a direct relationship between railway net earnings and railway purchases and the aggregate compensation of railway employees. The recent issuance by the Interstate Commerce Commission of wage statistics for December affords current proof of the directness of this connection, and discloses its effect upon our national economic structure.

Thus, in 1926 the railways earned a return of 5.0 per cent upon their investment, the highest figure in any year since the World War. In that year railway purchases of equipment, materials and supplies averaged $5,303,000 daily and the railway payroll averaged $8,193,000 daily. In other words, the total purchasing power of the railroads and their employees amounted, on the average, to $13,496,000 each day.

In 1928 railway earnings dropped to 4.7 per cent on the investment. Rail purchases fell to $4,182,000 daily, and rail wages fell to $7,820,000 daily, a total per day of $12,002,000. In 1929, the rate of return earned by the railways increased to 4.8 per cent. In keeping with this increase, the average daily purchasing power of the railways and their employees rose to $12,756,000.

In the last two years there have been drastic declines in railway net earnings, the return earned on property investment amounting to 3.3 per cent in 1930 and to less than 2 per cent in 1931. Likewise, the average daily purchasing power of the railways and

their workers dropped to $11,060,000 in 1930 and again to $8,191,000 in 1931.

The reductions in railway purchases have in turn reduced the sales of and the wages paid by those who normally sell to the railroads 23 per cent of the country's bituminous coal production, 20 per cent of the lumber output, 19 per cent of the fuel oil produced, 17 per cent of the iron and steel tonnage produced, and numerous other materials and supplies. Through the reduction in the railway payroll, practically every other industry in the country has been affected.

Railroads are large buyers and employers, when earnings permit. When they cannot buy or employ normally all other lines of business suffer. This close relationship between railway earnings and business in general points an obvious moral: that any measure which will improve the railway situation will have far-reaching beneficial effects upon the nation as a whole.

Operating Efficiency Continues to Improve

With traffic in a steady decline, some recession from the high level of operating efficiency which the railroads maintained in 1930 might have been expected in 1931. With their smaller traffic, it was to be expected that the railways would be unable to maintain previous averages with respect to carloads and trainloads. Also, necessity for strict economy forced them to permit an increase in equipment in bad order.

Consequently, it is the more surprising and gratifying that a number of railroads actually set new records for operating efficiency last year. With respect to that fundamental index of operating efficiency, gross ton-miles per train hour, the railroads as a whole showed an improvement in operating performance in 1931 in comparison with 1930. Some of them even showed a wider margin of increase in gross ton-miles per train hour in 1931, as compared with 1930, than they had made in 1930, as compared with 1929. On the Reading, for example, gross ton-miles per train hour in 1931 advanced to a record of 23,634, an increase of 1,202 over the figure attained in 1930 whereas the increase in gross ton-miles per train hour in the latter year, as compared with 1929, was only 964, the increase in 1931 having been the greatest accomplished in one year. The Boston & Maine likewise set a new record for gross ton-miles per train hour in 1931, when it established a new mark of 22,597, three per cent better than the average for 1930.

The operating departments of the railroads have reason to be proud of the records which they set in 1931. Their determination constantly to improve the efficiency of their operations, and their ability to effect such improvements despite many handicaps, offers encouragement at a time when it is badly needed.

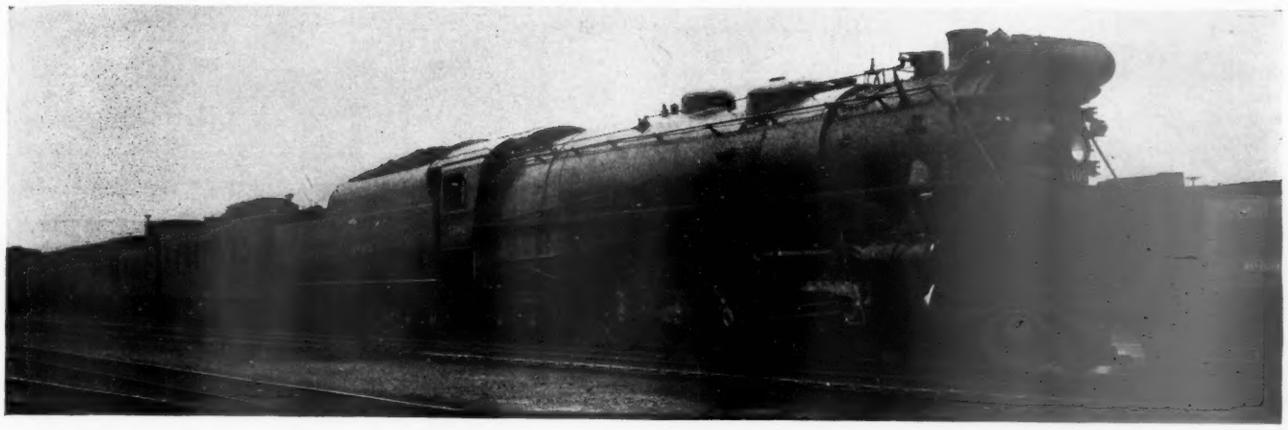
Electric Traction May Receive New Impetus

A single-phase traction motor without a commutator, developed in Switzerland, was described in a paper presented on March 15 before the Great Lakes district meeting of the American Institute of Electrical Engineers by Othmar K. Marti, engineer in charge of rectifiers and railway equipment of the Allis-Chalmers Manufacturing Company.

The motor has slip rings, but no commutator. In the case of the simple form of motor described by Mr. Marti, power is received from an alternating-current contact system and is carried through the motor armature, motor field and a mercury-arc rectifier, all connected in series. The flow of current is controlled by grids placed over the anodes of the rectifier. These grids are supplied with controlling voltages and operate in a manner similar to the control grid of an ordinary radio tube. The grids in turn are supplied with the proper voltages at the right moments by a timer, or low-power control commutator, which is driven by a synchronous motor. The rectifier changes the alternating current to a pulsating uni-directional current and the grids can be made to start the arc at any moment in the cycle, thus in effect chipping off pieces of the current wave and, by adding them together, produce any desired amount of current through the motors. The speed can be controlled in this way, and also by other methods which Mr. Marti refers to, but does not describe. It is apparent, however, that the rectifier functions as starter, rectifier, and commutator.

The motor has proved its qualities sufficiently on block test to warrant the equipping of a large Swiss locomotive with this kind of apparatus, and this work is now proceeding.

Another paper by Von E. Kern, published in German in the November, 1931, issue of Electrische Bahnen, sheds some additional light on the operations of the motor. It is evident that while the locomotive requires the addition of the rectifier, this may be much more than offset by the absence of commutators and a major part of the switching and control equipment. It also appears that a locomotive equipped with this kind of apparatus could be designed to operate equally well from an 11,000-volt, alternating-current, or a 3,000-volt, direct-current trolley. If this is borne out in practice, it should dispense entirely with the old "Battle of the Systems" and provide a motive power unit which could operate on any track equipped with either kind of distribution system. There is nothing about the new locomotive that would require changes in power supply or contact system or would restrict the use of existing equipment in its present form. The new locomotive holds the promise of a relatively inexpensive and universally applicable type of electric motive power.



The Baldwin-Built Locomotive Ready for a Test Run

Lehigh Valley Tests 4-8-4 Type Locomotives

Locomotives Nos. 5100 and 5200 each demonstrate ability to produce $80,000 more revenue annually than locomotives now in use

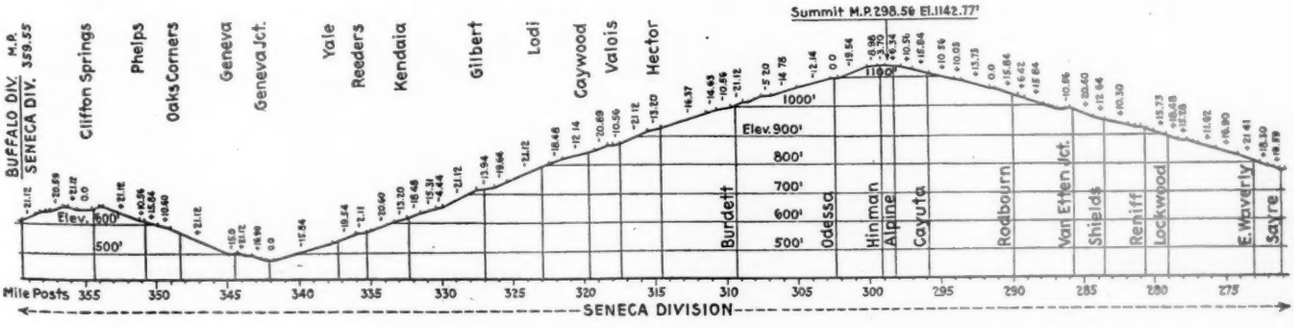
By F. E. Lyford

Special Engineer, Lehigh Valley

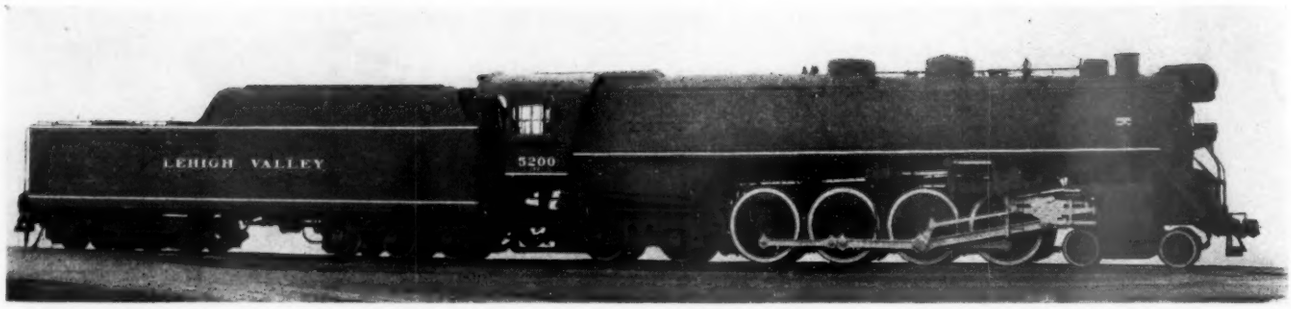
AFTER making a careful study of its motive power requirements for present-day freight movements, the Lehigh Valley arrived at a definite conclusion as to the tonnage and schedule times desired for movement of its fast freight trains. Instead of specifying a certain design of locomotive, the American Locomotive Company and the Baldwin Locomotive Works were each asked to submit a locomotive of their own design which would meet the railroad's needs. The only restrictions were those of weights, clearances and certain equipment details. In Table I are shown the schedule allowances which were specified for these locomotives hauling 3,000 tons.

An experimental locomotive was purchased early in 1931 from each builder and these two locomotives were the answer of each builder to the railroad's problems. The differences between these two locomotives are shown in the brief table of specifications, Table II, which also includes specifications for the present freight engines used in symbol train service. More extensive data concerning the new locomotives were published in the April 4, 1930, issue of the *Railway Age*, page 669.

After breaking in, each locomotive made a through run from Buffalo, N. Y., to Newark, N. J., to determine its ability to meet the specified tonnage and schedule requirements. In Table I the actual performance is compared with the specified conditions. The locomotives were then equipped with indicators and other necessary instruments and thoroughly tested, the Westinghouse dynamometer car being used. The usual test data were taken, coal and water accurately measured, and complete records kept of engine performance. The tests



Profile of the District Over Which the Tests Were Run



The American-Built Locomotive

were conducted to compare the performances of the two locomotives in every detail and, as they would be used at their maximum rating, the engines were worked at their maximum output wherever possible. The test ground where the basic comparisons were made was an 89-mile division between Manchester, N. Y., and Coxton, Pa., with 42 miles of almost uniform grade of about 16 ft. per mile. This gave at least an hour's run where the maximum horsepower had to be maintained,

Table I—Specified and Actual Tonnage and Time Over the Road

		Specified			No. 5100 Actual			No. 5200 Actual		
	Miles	Time Hrs.	Min.	Tons	Time Hrs.	Min.	Tons	Time Hrs.	Min.	Tons
Buffalo to Manchester	90	3	0	3,000	2	52	3,219	2	59	3,118
Manchester to Sayre	89	3	0	3,000	2	31	3,097	2	33	3,011
Sayre to Coxton	85	2	15	3,000	2	9	3,018	1	52	2,878
Coxton to Gracedale*	21	1	30	3,000	1	29	3,018	1	27	3,213
Gracedale to Mahoning	41	1	30	3,000	1	25	3,018	1	19	3,213
Mahoning to Newark†	107	3	15	3,000	2	47	3,138	3	5	3,069

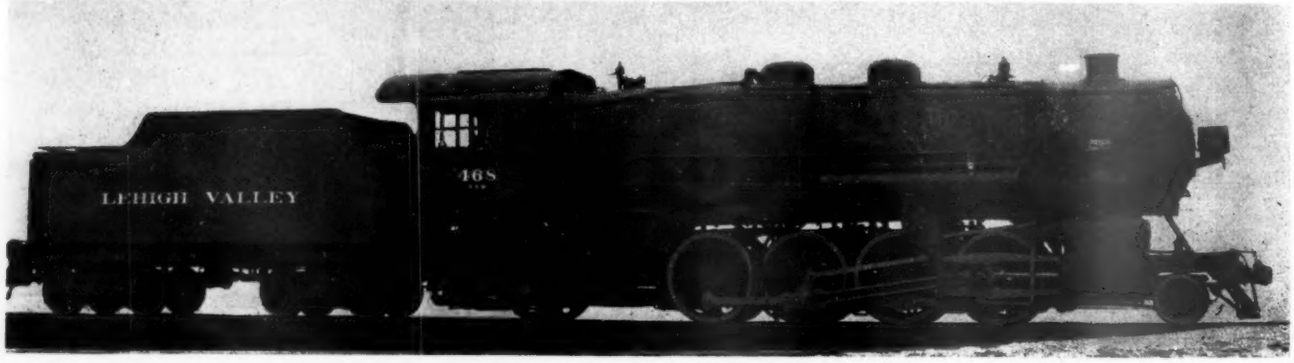
* With one 2-10-2 type helper.
† From Newark to Oak Island (Jersey City) is a switching movement.

this showing fully the boiler capacity and engine performance for a sustained run.

When the locomotives were received for test, certain minor adjustments to valves, etc., were made based on the results of the first run and the cards taken. When the locomotives were adjudged satisfactory by the road and the builders' representatives, several runs were made each way in order to obtain averages for comparison. The results shown in Table III are the averages of five runs for the Baldwin locomotive No. 5100 and six runs for the American locomotive No. 5200. The eastbound runs were chosen for comparison as they had the fewest variables due to operation and also provided the long upgrade as a test of the sustained output of each locomotive. However, the westbound averages are also shown in order completely to show the results on this division. Each set of figures is divided into two parts, one showing the results over the complete division and the other part giving results for the hills alone.

Table II—Comparison of the Principal Dimensions and Proportions of the Locomotives Tested and Those in Comparative Service

	New locomotives		Locomotives now assigned to fast-freight trains	
Builder	Baldwin	American	.....	.....
Type of locomotive	4-8-4	4-8-4	4-6-2	2-8-2
Road number	5100	5200	....	....
Road class	T-1	T-2	K-5½	N-5
Service	Fast freight			
Maximum tractive force	66,400 lb.	66,700 lb.	48,723 lb.	63,000 lb.
Tractive force, booster	18,360 lb.	18,360 lb.	None	11,000 lb.
Combined tractive force	84,760 lb.	85,060 lb.	.....	74,000 lb.
Cylinders, diam. and stroke	27 in. by 30 in.	26 in. by 32 in.	27 in. by 28 in.	27 in. by 32 in.
Valve gear, type	Walschaert	Baker	Walschaert	Baker
Weights in working order:				
On drivers	270,000 lb.	268,000 lb.	204,560 lb.	239,000 lb.
On front truck	55,000 lb.	65,200 lb.	52,140 lb.	29,500 lb.
On trailing truck	83,000 lb.	88,800 lb.	55,200 lb.	56,500 lb.
Total engine	408,000 lb.	422,000 lb.	311,900 lb.	325,000 lb.
Total engine and tender	774,200 lb.	780,800 lb.	493,800 lb.	547,200 lb.
Wheels, driving, diameter outside tires	70 in.	70 in.	73 in.	63 in.
Boiler:				
Steam pressure	250 lb.	255 lb.	205 lb.	200 lb.
Diam., first ring, inside	86 in.	84¼ in.	83¾ in.	90 in.
Firebox, length and width	132⅛ in. by 96¼ in.	132⅛ in. by 96¼ in.	120⅞ in. by 114¼ in.	120⅞ in. by 90 in.
Tubes, number and diam.	77–2¼ in.	77–2¼ in.	254–2¼ in.	234–2½ in.
Flues, number and diam.	202–3½ in.	202–3½ in.	45–5½ in.	50–5½ in.
Length over tube sheets	21 ft. 6 in.	21 ft. 6 in.	17 ft. 6 in.	17 ft. 6 in.
Grate area	88.3 sq. ft.	88.3 sq. ft.	95.2 sq. ft.	75 sq. ft.
Heating surface:				
Tubes and flues	4,932 sq. ft.	4,933 sq. ft.	3,734 sq. ft.	3,652 sq. ft.
Total evap.	5,422 sq. ft.	5,441 sq. ft.	4,118 sq. ft.	4,009 sq. ft.
Superheater	2,256 sq. ft.	2,243 sq. ft.	980 sq. ft.	1,074 sq. ft.
Comb. evap. and superheat.	7,678 sq. ft.	7,684 sq. ft.	5,098 sq. ft.	5,083 sq. ft.
Tender:				
Water capacity	18,000 gal.	18,000 gal.	12,000 gal.	12,000 gal.
Coal capacity	28 tons	28 tons	17½ tons	17½ tons



One of the Eight-Year-Old Mikados

In these tables the drawbar horsepower figures are not corrected for grade as they are the average for the distance shown.

A large number of indicator cards were taken on both locomotives. These were taken on a predetermined program for which places were picked to show various conditions of the engine and train. The cards were carefully gone over and only those were worked up that showed no variations in themselves or their related data.

horsepower-hour in favor of the new locomotives. Evaporation is increased 1 lb. of water per pound of coal. In addition to these tangible factors, there are the intangible factors of faster schedules, elimination of water and meeting stops, less wear and tear on equipment due to cutting out these stops and other matters of varying importance.

To show more clearly the advantages of the new locomotives from the operating standpoint, the compara-

Table III—Comparison of Performance Averages on the Test Runs

	Eastbound				Westbound			
	5200		5100		5200		5100	
	Complete	Hill	Complete	Hill	Complete	Hill	Complete	Hill
Tonnage	3,011	3,011	3,097	3,097	3,151	3,151	3,392	3,392
Cars	77	77	66	66	128	128	110	110
Train sheet time	153	.....	151	.....	.....	.....	.....	.....
Working time, hr.	131.2	73.7	128.5	75.2	159	100.5	145.6	101.8
Time of stops, min.	5.2	.....	9.4	.....	24	.....	11.0	.....
Average back pressure, lb.	.....	14.33	.....	14.12	11.62	11.98	11.56	11.56
Average draft	.....	11.60	.....	10.13	9.84	10.07	9.2	9.2
Total coal, lb.	22,888	12,666	19,941	12,841	22,730	16,497	20,410	15,498
Coal per sq. ft. grate	108.2	117	105.4	116	97.1	111.16	96.9	103.1
Coal per drawbar hp.-hr., lb.	3.26	3.16	3.43	3.31	3.40	3.55	3.47	3.43
Drawbar hp.	2,929	3,240	2,724	3,115	2,525	2,777	2,469	2,653
Drawbar pull, lb.	30,230	35,899	27,944	35,085	31,725	42,281	32,277	39,607
Drawbar hp.-hr.	6,412	4,009	5,836	3,899	6,691	4,650	5,920	4,502
Total water, gal.	139,562	79,965	133,175	80,145	146,717	106,321	140,867	103,637
Steam to cylinder per hr., lb.	62,229	63,313	60,908	62,894	53,159	61,694	57,436	59,701
Water per lb. coal, lb.	6.71	6.32	6.73	6.36	6.41	6.42	6.92	6.76
Water per drawbar hp.-hr., lb.	21.79	19.92	22.90	20.89	21.65	22.76	23.83	23.09
Mechanical efficiency, per cent	.....	91.72	.....	89.8	.....	93.3	.....	91.8
Engine friction, lb.	.....	3,451	.....	4,043	.....	3,252	.....	4,406

Most of the cards worked up were those taken at maximum output, and the average mechanical efficiencies from these cards and their related dynamometer readings are shown in Table IV.

In order to show in greater detail the various horsepowers obtained, Table V gives a few of the indicated and corrected drawbar horsepowers, corresponding mechanical efficiencies and the speeds at which they were obtained.

It must be remembered that during the test everyday operating conditions existed. Engine crews were taken as they came and trains and weather conditions varied. While the practice of an engineman was watched and at times changed from the dynamometer car, the firing of the engine was a variable of considerable magnitude. It is, therefore, interesting to note how closely the two locomotives compare throughout the data shown.

Both locomotives exceeded their guaranteed performance, as on the test division they averaged about 20 min.

Table IV—Average Mechanical Efficiencies of the Two Locomotives

Locomotive	Efficiency, per cent	
	Eastbound	Westbound
5100	89.8	91.8
5200	91.7	93.3

under the set schedule with approximately 100 tons over the required rating. Similar gains in speed and tonnage were shown in the test runs over the rest of the system.

These new locomotives showed great economy as compared with the locomotives now used which are eight-year-old Mikados and fourteen-year-old freight Pacifics. Based on the test division, alone, in comparison with a Mikado, the new locomotives will show an added yearly revenue per locomotive of $80,000 and this will come with other savings in fuel and maintenance. This figure is conservative as it is based on 22 trips per month, eastbound, over one division, hauling 500 tons more than the Mikados. The figures for fuel saving show a decrease of 25 lb. of coal per thousand gross ton-miles, or a decrease of 1 lb. of coal per drawbar

tive figures for the test division are illuminating. With the present power the symbol trains are hauling from 2,000 to 2,500 tons on an eastbound schedule of 2 hr. 45 min. Referring to the table of averages, it will be seen that the new locomotives are capable of hauling over 3,000 tons on a schedule of about 2 hr. 30 min. These figures of time and tonnage have both been bettered since the test runs were made. This increase over the present power is, of course, applicable to the other divisions as was shown on the test runs and in operation since.

At present the two new locomotives are being used in milk and passenger train service over the heavy grades east of Wilkes-Barre, Pa., on the Wyoming di-

Table V—Typical Performances at Various Speeds

Speed, m.p.h.	Indicated hp.	Corrected drawbar hp.	Mechanical efficiency, per cent
LOCOMOTIVE 5100			
36	3,998	3,554	88.9
35	3,900	3,509	90.0
34.2	4,032	3,771	93.5
36	4,050	3,694	91.2
38.4	3,691	3,209	87.0
32.4	3,706	3,275	88.4
39	3,766	3,417	90.7
13.5	2,246	2,064	91.9
15.5	2,425	2,241	92.4
27	3,211	2,884	89.8
LOCOMOTIVE 5200			
29.4	3,910	3,527	90.2
27	3,281	2,894	88.2
33	4,101	3,865	94.2
32.4	4,035	3,789	93.9
36	3,764	3,373	89.6
34.8	3,750	3,433	91.5
37.8	3,628	3,315	91.4
13.8	2,335	2,175	93.2
15	2,506	2,334	93.1
38.4	4,041	3,523	87.2

vision. The savings in elimination of helper and crew expense here are very great. For example, two milk trains have been combined into one train and helper service is needed only when this train exceeds a certain tonnage. This helper service is required for 20 miles eastbound. Passenger trains are handled east and west over the grades of this division without helpers to a much greater extent than is possible with other available power.

The results of these tests have given the Lehigh Valley accurate data on which to base the economic value of new power compared to present power. They have shown the manner in which the builders answered the problem given them and, because of this, as is already known, 20 new engines similar to the ones tested have been ordered.

The tests were in charge of the writer and each locomotive builder had a representative present during all the tests on both locomotives. These representatives assisted in working up and checking all the results of the tests. The dynamometer car of the Westinghouse Air Brake Company was used and was in charge of the Westinghouse dynamometer engineer at all times.

Chicago Hearing Yields More Facts on Railroad Fuel

Investigations show coal buying and prices influenced by commercial traffic

WHILE Illinois miners and operators were gathered in one room of the Sherman hotel, Chicago, last week, debating the possibility of a strike that would paralyze coal mining in Illinois next month, investigators of the Interstate Commerce Commission sat in another room gathering further facts about railway coal purchasing methods. The Chicago hearing, which followed closely upon the conclusion of similar hearings at Detroit, opened with statements regarding the coal purchases of the Louisville & Nashville, after which officers of the Illinois Central, the Chicago & Eastern Illinois, the Baltimore & Ohio Chicago Terminal, the Chicago, Indianapolis & Louisville, the Wabash, the Belt Railway of Chicago and the Elgin, Joliet & Eastern were questioned regarding their fuel practices. The hearing continued all this week, during which other roads were examined along the same lines.

Louisville & Nashville

Reciprocity for commercial tonnage is not a factor in the negotiations with coal producers on the L. & N., according to H. T. Shanks, general purchasing agent, but the road buys all of its coal at home. The practice, as he described it, has been to get bids once a year from all approved operators and to contract at the prices quoted for certain minimum and maximum tonnages during the coal year. The length of haul is taken into consideration, as well as the capacity of the mine, in arranging the contracts.

The entire supply is covered by these contracts, Mr. Shanks said. The specifications differ somewhat between coal fields, but are uniform in each field. While each contract calls for coal entirely free from impurities, the terms are liberally construed and also provide for substitutions of one size of coal for another at times to suit the requirements of the mines in filling orders for commercial coal. The road, he said, doesn't think much of analyses except where a dispute may arise as to the quality of coal shipped.

This method of obtaining coal is still followed, he said, except that instead of making contracts with operators at the prices bid, the quotations in each district are now averaged and a uniform price established for that district. It is not a weighted average. Mr. Shanks agreed that this resulted in some operators being paid higher prices than were bid, but he said that the spread between the prices was not considerable and also did not think that this method resulted in operators quoting high prices in order to raise the average. The average price paid for coal was $1.635 per ton, exclusive of freight, in 1929, $1.104 in 1930, $1.459 in 1931, and the fuel consumption in freight service was 142 lb. per 1,000 g.t.m. in 1929 and 141 lb. in 1930 and in 1931.

Questioned about records purporting to show that other roads, including the Seaboard Air Line, had purchased a washed coal from the Alabama By-Products Company in the Birmingham district for $1.52 a ton, when the Louisville & Nashville was paying $1.95 to $2.05 per ton, he said that foreign roads had contracted for the coal after the L. & N. had awarded its contract and gave the examiner to understand that in order to correct this condition the road had arranged not to make any new contracts this year until operators in that district had made their contracts with the other roads. It being alleged that other roads were buying coal from other districts on the L. & N. at prices from 25 to 40 cents less per ton than the L. & N. was paying, Mr. Shanks stated that it was not the road's intention to pay more than operators were willing to sell coal of equal quality to other roads. The road, however, does not favor price cutting, he declared, believing rather in paying fair prices. Differences in the quality of coal from operators in the same field are disregarded on the L. & N., according to Mr. Shanks, so long as the fuel proves satisfactory for the service.

Baltimore & Ohio Chicago Terminal

H. B. Voorhees, president of the B. & O. C. T., corroborated the testimony of C. H. Dyson, fuel agent of the B. & O., at the New York hearing that the fuel requirements of the B. & O. C. T. had been purchased entirely through the Globe Coal Company, a sales agency, under a contract which had been extended from year to year, but stated that the price was subject to readjustment every year and maintained that since he became president in 1929, his policy had been to secure prices that were in line with the prices paid by the B. & O. for comparable fuel, and also stated that if higher prices were paid at any time, it was because of the B. & O. C. T.'s smaller purchasing power. He said that when it was learned that the B. & O. was getting coal for $1.50, he forced a reduction in the price of the B. & O. C. T. coal, which was $1.55 at that time. Subsequently, Mr. Dyson stated that the price of $1.25 paid by the B. & O. for coal, with which the price of $1.35, paid by the B. & O. C. T. from the same dis-

trict, was compared, was in reality a price paid for the tonnage of spot coal and that at the same time the B. & O. was paying $1.50 for contract coal. Under further questioning, Mr. Dyson stated, however, that in negotiating with the Globe Coal Company for the prices to be paid by the B. & O. C. T. for coal in 1930, he had allowed the Globe Company a commission of 5 cents above the B. & O. price in that district.

Since the records showed that all the coal purchased by the Globe Coal Company for the B. & O. C. T. was obtained from mines on the B. & O. in Pennsylvania and West Virginia, 500 or 600 miles from Chicago, Mr. Voorhees was further interrogated as to the reasons for that practice, considering that other roads were getting coal from Indiana and Illinois, according to Attorney M. C. List, for $1.50 per ton less on the delivered basis than the Eastern coal was costing the B. & O. C. T. when the freight paid to the B. & O. was added. His answer was that the coal and the service were considered more satisfactory and that he did not consider the freight charges paid to the B. & O. in his calculations.

Illinois Central

Competition among Illinois railroads for freight has been the cause of suspending operations of a large company-owned mine, said A. C. Mann, vice-president. The I. C.'s coal, Mr. Mann stated, is obtained chiefly from Central and Southern Illinois, Western Kentucky, and from mines on the St. Louis-San Francisco in Alabama where the road has certain trackage rights. Until May, 1931, coal for the lines north of the Ohio river was obtained almost entirely from the Madison Coal Corporation, a subsidiary of the Illinois Central, although a small amount was purchased in the same field to help in producing traffic for the railroad. The prices of the latter fuel and also for that coal obtained from Western Kentucky have been determined by conferences to give fair prices to operators and the railroad, while the Frisco's price is paid in the Alabama field. The distribution of coal orders has been made in accordance with the recommendations of the traffic department.

For several years, according to Mr. Mann's testimony, a gradual decline was noted in the road's freight traffic from the Illinois mines, particularly from mines having trackage arrangements with other railroads, and the management decided to close its Madison mine and purchase coal for its Northern and Western lines in the belief that such a policy would result in getting back considerable traffic. This plan became effective in the early part of 1931 and the policy was adopted of purchasing approximately 50 per cent of the fuel for the Northern and Western lines at the lowest price obtainable without taking the entire output of any one mine as determined by bids, while orders for the other 50 per cent were distributed on the basis of recommendations from the traffic department at prices considered fair to the railroad and the operator. Prices paid in Illinois for coal purchased on this basis, it was brought out, ranged from $1.50 a ton to strip mines to $2.15 to joint mines, producing an average price of Illinois coal of $1.72 per ton. The price paid to the company's mine in 1930 was $2.

When Mr. Mann's attention was called to records showing that the road was paying $1.75 per ton to one mine in Illinois and $2.10 per ton for similar coal from a junction mine, he frankly stated that the higher price was paid to the junction mine for traffic reasons, explaining, however, that the latter prices were the lowest prices at which the junction mines would sell the coal and reflected the success with which the junction mines with commercial traffic to route were able to play one road against another.

J. F. Porterfield, general superintendent of transportation, questioned regarding records purporting to show that differently-priced coals, considering transportation charges as well as mine prices, were received at identical points, explained that this was simply the result of hauling the coal to concentration points where it was frequently used to fill out trains. He considered that it was seldom that coal from different fields would reach the same destination except in cases of emergency. J. F. Dartt, auditor of disbursements, did not think that the Yazoo & Mississippi Valley and the Gulf & Ship Island were charged for any backhaul on coal shipments.

Chicago & Eastern Illinois

The C. & E. I., testified F. G. Nicholson, vice-president of operation, obtains 95 per cent of its fuel requirements from mines on the C. & E. I., in order to help support local industries and retains the remaining 5 per cent for allocation to mines on other roads for the purpose of influencing traffic. All the coal is allotted on the basis of commercial traffic received from each mine. Screenings are specified for stoker-fired locomotives, while mine, egg and nut are purchased and mixed for the hand-fired power. Differences in quality of the coal used for the same purpose are ignored on the theory that a satisfactory coal is obtained and that it is good policy to accommodate the producer even at some sacrifice in quality.

The records show that the C. & E. I. bought coal from mines on the L. & N. for $1.05 per ton when the L. & N. paid $1.35 to $1.50 per ton and that the C. & E. I. paid $1.60 for run-of-mine coal from local mines when the Belt Railway of Chicago paid $1.85 per ton. Mr. Nicholson also testified that the C. & E. I. had no policy of paying more for coal from mines on the C. & E. I. than was paid for coal from mines on foreign lines, nor less for coal on the C. & E. I. than foreign lines paid. The same prices are paid for strip and shaft coal. When asked to explain why the road paid $1.80 for run-of-mine coal and $2 for sized coal in Indiana, as compared with the price of $2.15 for all coal in the Southern Illinois field, he testified that the arrangement in Indiana was an accommodation to help the producers sell fine coal. The road, he said, waives per diem accruing on cars of distress coal while in transit on the C. & E. I. He attributed the reduced fuel consumption on the C. & E. I. to better firing and to mechanical improvements.

Chicago, Indianapolis & Louisville

The Monon, according to the testimony of J. H. Liebenthal, purchasing agent, obtains its fuel requirements from four producers on the line of road, operating principally in Indiana, and also purchases considerable distress coal. The operators supplied the coal on orders rather than on contracts, at prices ranging from $1.25 to $1.75 per ton, in 1931. These prices were fixed on the basis of negotiations with operators, and with a view to paying the lowest price possible at which a dependable supply of coal is obtainable.

When distress coal is purchased, the freight charges accruing on the Monon are waived, but per diem is collected up to the time such coal is delivered to the coal chute. The same price is paid for strip as for shaft coal, he said, but strip coal must be above 1½ in., thus allowing for the greater slacking that occurs with this coal before it is used.

His attention having been called to the fact that the Monon was paying from 35 cents to 40 cents per ton

less than other roads in the same district, he said he neither considered the prices paid were below cost of production nor felt that better prices could be obtained by competitive bidding. No trouble had been experienced, he contended, with the coal in road service. The fuel consumption was 149 lb. per 1,000 g.t.m. in 1929, 140 lb. in 1930, and 134 lb. in 1931. He attributed the improvement to better preparation of the coal, heavier power and better firing.

Wabash and Ann Arbor

T. J. Frier, purchasing agent of the Wabash and Ann Arbor, testified that 75 per cent of the Wabash's coal is contracted for from on-line mines on the basis of yearly bids, and that the remaining 25 per cent and all of the Ann Arbor coal is obtained off line on the basis of monthly bids. The amount of coal bought from different fields, he said, is governed by the length of haul and the cost of transportation to the consuming point. The allocation of coal among different producers is made in accordance with the recommendations of the traffic department on the basis of the commercial tonnage handled during the previous year, although no fixed ratio is used in determining how the division is made.

The road buys very little distress coal, he stated, and does not approve paying higher prices because of traffic than other roads pay for coal on the Wabash. He expressed the belief that the prices paid in each instance were the lowest at which the coal could be purchased and were in line with prices paid by other roads for comparable fuel. He said he knew that the Belt railway had purchased coal from a certain mine on the Wabash for $1.55, compared with the price of $1.75 per ton paid by the Wabash, and had used the difference in price as an argument to reduce the Wabash's price in subsequent contracts, adding that he would not hesitate to pay a price as low as $1.55 per ton for coal on the Wabash even though it was below the cost of production. The contracts are made directly with the producers with few exceptions, he said, with the source of coal specified.

Asked for reasons actuating the road in purchasing coal from mines on the Chesapeake & Ohio and the Norfolk & Western, instead of on the Wabash for certain destinations, he stated that it was because of the lower transportation costs, considering the line haul costs as well as freight. This coal, he said, was purchased through various sales agencies upon the recommendation of the traffic department. The fact that coal from different sources and reflecting different costs to the Wabash, considering the transportation charges, was received at identical destinations, as shown by the record, was explained by Mr. Frier with the statement that these instances were few and usually reflected some special operating condition rather than the fuel policy of the Wabash.

Belt Railway of Chicago

The Belt Railway of Chicago, has a unique method of purchasing its coal, according to testimony of C. W. Yeamans, purchasing agent. Eight of the 13 roads owning the Belt, he said, are coal-producing roads, and the Belt divides its fuel purchases so that operators on each of these coal-producing carriers, will get some of the business, the divisions being made on the basis of the extent to which the roads use the Belt as shown by the number of cars switched. This requires that the road place orders in different districts at different prices, which varied in 1931 from $1.35 to $2.05 per ton at the mine, but in all cases, a mine price is established which, when the freight to Chicago is added, reduces all the coal to the same delivered price of $2.85 per ton. The spot coal, as well as that purchased on yearly contract, is purchased in the same way. While some of the coal was shown to have been purchased at higher mine prices than were bid, Mr. Yeamans stated that the road aims to pay a reasonable price for its coal and, when the mine price of $1.50 per ton for coal purchased in Indiana was compared with the mine price of $2.05 per ton for coal obtained from mines in Northern Illinois, he stated that the Northern Illinois coal cost more to produce on account of the thinner steam.

Elgin, Joliet & Eastern

For many years, C. H. Kenzel, purchasing agent of the Elgin, Joliet & Eastern, testified that road, which is owned by the U. S. Steel Corporation, has obtained its entire supply of coal from two mines in Westville, Ill., near Danville, which are operated by the U. S. Fuel Company, also a subsidiary of the steel corporation. A mine price of $2.05 per ton is now paid for this coal, as compared with a price of $2.10 paid in 1929 and 1930, to which is added a transportation charge of 5 mills per ton-mile for the haul over the C. & E. I., on which the E. J. & E. has traffic rights. The coal is the best obtainable in Illinois, with the exception possibly of more remote coal, Mr. Kenzel contended, and insures a uniformity of preparation which has enabled the road to adapt its power unusually well to use the fuel to the best advantage. The road's fuel consumption in freight service was 133 lb per 1,000 g.t.m. in 1929, 124 lb. in 1930 and 120 lb. in 1931.

The U. S. Steel Corporation issues inter-company price lists quarterly, he said, and the E. J. & E. pays these prices for the coal, placing its orders each week. While contending that the source of supply was not absolutely dictated, he said the price was considered reasonable and, with the trackage rights over the C. & E. I. and the method of handling the coal in solid coal trains made up for all the U. S. Steel subsidiaries, the road has been enabled to secure its coal at prices as low or lower than would be the cost of similar fuel. The examiner called his attention to the mine price of $1.55 paid by the Belt for coal from the same vein on the Wabash, I. C., C. B. & Q., and C. & E. I., and questioned the reasonableness of the price of $2.05 paid by the E. J. & E., and also the point made by the attorney for the E. J. & E. that the trackage arrangement with the C. & E. I. would not permit the road to secure its coal supply on other lines and ship it over the C. & E. I. free of revenue freight charges.

* * *

Looking North over the Electrified Yards of the Illinois Central, Toward the Chicago Skyline

Railways Give Views on Motor Regulation

WASHINGTON, D. C.

CONGRESS has ample authority under Supreme Court and other judicial opinions to regulate contract motor carriers engaged in transporting persons and property for hire in interstate commerce, Alfred P. Thom, Jr., general solicitor of the Association of Railway executives, told the Senate interstate commerce committee on March 14. "To deny the power of Congress to prevent it, is to deny the power to prevent chaos in interstate commerce," Mr. Thom said.

Mr. Thom appeared as the last witness for the Association of Railway Executives in the hearings on the bill introduced by Senator Couzens proposing a plan for federal regulation of motor buses and trucks with limited regulation over contract carriers.

"In the hearings before this committee," said Mr. Thom, "the power of Congress to regulate interstate commerce when carried on by a contract carrier by motor vehicle has been challenged on the grounds that it can not be regulated because it is not 'clothed with a public interest.' Regulation of contract carriers by motor vehicles is necessary in order to regulate effectually common carriers by motor vehicle. The former, if they can not be regulated, can set at naught the approved principles of regulation, which require reasonable rates, prohibition of rebates, favoritism and unjust discrimination. Thus a situation could be created where a substantial part of the country's traffic would move in interstate commerce in defiance of the settled policy of Congress.

"The power of unregulated contract carriers to break down the admittedly valid regulation by Congress of interstate commerce when moved by common carriers demonstrates the fact that such unregulated carriers when engaged in interstate commerce are 'clothed with a public interest.' There is ample precedent in the decisions of the Supreme Court of the United States for the regulation of private business when it bears such a relationship to interstate commerce that it becomes 'clothed with a public interest.' It has been held that the business of elevation of warehousing, of fire insurance, of commission merchants in stockyards, of the packers and of the boards of trade, although not a business of common carriage, were each clothed with a public interest because each 'bears such a peculiar relationship to the public interest that there is superinduced upon it the right of public regulation.'

"In none of these cases is its effect upon interstate commerce, which Congress has the power and the duty to protect, so direct as is the effect of unregulated motor vehicles engaged in interstate commerce on the highways, but not as common carriers; for such unregulated motor vehicles seriously impair, if they do not entirely destroy, the power of Congress to regulate interstate commerce so that it will all move under rules deemed essential by Congress to the public welfare. It seems clear, therefore, that motor vehicles engaged in interstate commerce on the highways, whether or not they are common carriers, are clothed with public interest, and are, therefore, subject to congressional regulation.

"In the light of the principles established by the decisions of the Supreme Court of the United States, there can be no doubt that if the Congressional legislation proposed recites that it is impossible, without regulating contract motor carrier trucks operating on the highways in interstate commerce for compensation or hire, to regulate adequately common carriers by railroad or by motor vehicle, the regulation to the extent deemed necessary by Congress of such contract motor trucks would be upheld as constitutional.

"Equality of treatment and of commercial opportunity to all shippers in interstate commerce—equal and reasonable rates and protection against rebates, unreasonable preferences or advantages and unjust discriminations—are, in the opinion of Congress, the cardinal principles of fairness in trade on which the system of regulation rests. This would be impossible if a substantial part of interstate commerce remains unregulated and is permitted to move in defiance of the saultary principles referred to. Regulation of some of the instrumentalities of interstate commerce, in requiring them to give to shippers equality of treatment and of commercial opportunity, while other instrumentalities are left free to make unreasonable rates and give rebates and unreasonable preferences and advantages and to be guilty of unjust discriminations between shippers, would be unjust not only as to the regulated carriers but also unjust to the shippers who must use them. This would also enable large shippers to obtain an advantage over weaker competitors by securing the distribution of their merchandise on special terms through their ability to command the services of a contract carrier, which not being a common carrier, would not be available to their competitors."

Continuing his testimony reported in part in last week's issue, Dr. C. S. Duncan, economist for the association of Railway Executives, also said:

"From the fact of state ownership of and responsibility for the highways and from the fact that commercial operations over these state highways are so largely intrastate, it follows that the foundation of just and reasonable regulations and requirements for such commercial operations must be laid by the states. Federal action should fill the hiatus existing as to interstate commerce. Since such foundation has already been laid by the states, action by the federal government is now due in order that interstate operations shall not escape just and reasonable requirements and regulation imposed upon the intrastate operations over which the state has jurisdiction. If Federal action should first take the form of requiring interstate operation to meet in a just and reasonably way all state regulations and requirements, then such interstate operations will have imposed upon them progressively the improved regulations and requirements adopted by state legislatures.

"Thus, then, attention is focused on state action with respect to highway commercial operations. The present status of such action is far from satisfactory, lacking not alone in uniformity and enforcement but also in a fully informed and scientific basis. Progress lies in these directions:

(a) A recognition that the use of the highway for commercial purposes in the field of competition with existing transportation agencies is essentially different from the use by the private passenger cars.

(b) Commercial use of the public highway in this field is an economic proposition and must be considered on the basis of all elements of cost.

(c) In the construction and maintenance of public highways open to commercial use, careful consideration must be given to all additional costs incurred due either to width or strength of surfacing, stronger bridges, wear and tear, grades and locations, and all such additional costs should be charged directly against the commercial users on a just and reasonable basis.

(d) Full jurisdiction and power of control should be given to some appropriate body over the number, character, size,

weight, width, length, height and speed of all motor vehicles operating over highways, with adequate force to enforce the law.

(e) Recognition must now be had of the fact that motor vehicle operations, both in passenger and in freight service, have reached the degree of importance to affect the condition of existing transportation facilities and, therefore, must bear the corresponding responsibilities of that position, in view of the fact that such existing transportation facilities are public service agencies and are essential to the public welfare.

(f) Recognition must also be had of the fact that commercial operations, especially by trucks, have become such an important influence in business competition that the rates charged affect the competitive relationship of manufacturers and merchants and, therefore, rise above a mere private transaction.

(g) And finally, recognition must be had of the fact that in the competitive relationship between railroads and commercial operations on the highways, conditions can not be fair, the true economic status cannot be determined, motor vehicle transportation cannot develop on a stable economic foundation, regulation will be undermined and an essential industry will be threatened so long as railroads are so comprehensively regulated in all essential respects, including rates, while highway commercial operations do not pay all legitimate costs, are left free to give rebates, to discriminate between persons, commodities and places and to select only the traffic most desirable to handle.

"In the consideration of the question as to what shall be the terms and conditions prerequisite for operation in interstate commerce over the highways, that is, proper regulation under public authority, so that competitive relationships may be fair and just and coordination most effectually achieved, there are these methods of approach:

1. To relax and liberalize certain regulatory provisions now applying to rail carriers;

2. To impose corresponding regulatory provisions over highway operations in interstate commerce; and

3. A combination of these two methods.

"There is, of course, something that may be done under existing conditions and without substantial change in the present interstate commerce act and that is a more liberalized administration of the provisions of that act in view of changed conditions. Attention is seriously directed to the following:

1. The need for the commission to give due consideration to the new and menacing competition on the highways in administering all the provisions of the interstate commerce act as apply to rail carriers.

2. The rigidity and inter-relationship of the present rail-rate structure and the handicaps which face the rail carriers from the progressive application of the transportation-at-cost or zoning, or mileage rate theory now apparently held by a majority of the commission.

3. The patent fact that the fundamental concept lying at the base of railroad regulation in the provisions of the interstate commerce act, namely, the natural monopoly of transportation by railroad, is no longer tenable to the extent that an alternative choice of facilities is being offered to and utilized by shippers.

4. The fact that as the volume of traffic available for rail carriers, due to diversion to competitive types of transportation, becomes smaller, the inevitable consequence is the imposition of heavier charges upon that traffic which must of necessity use rail transportation. The obvious reason for this is that a railroad is a business with a high proportion of fixed costs and these costs do not decrease in step with a decrease in traffic."

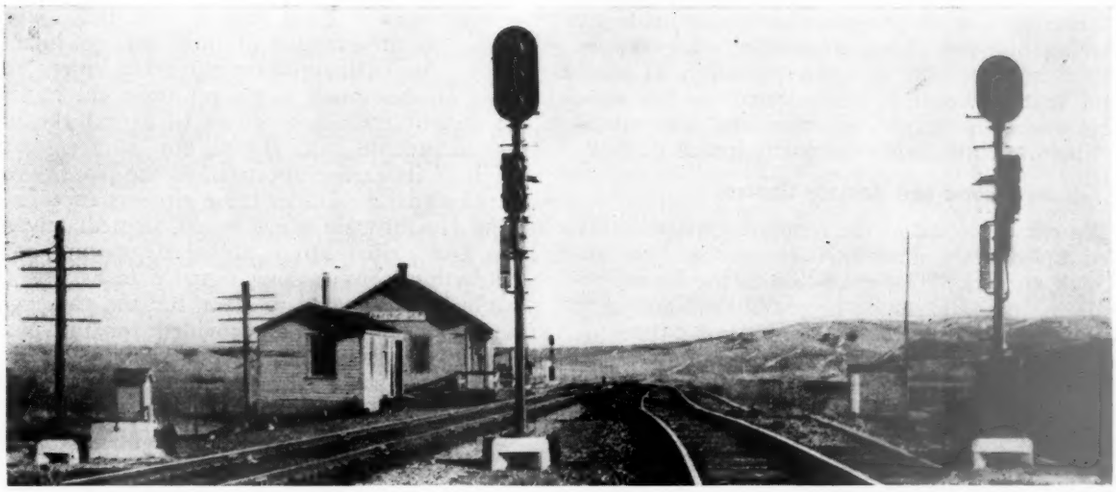
A. P. Russell, executive vice-president of the New York, New Haven & Hartford, and chairman of the motor transport division of the American Railway Association, made suggestions on March 10 for changes in the Couzens bill. He suggested omission of a provision which would authorize the Interstate Commerce Commission to establish reasonable requirements as to the weight and size of motor vehicles, saying that while he approved of the principle of uniformity in such requirements it was thought that that matter might be left to the states. He also suggested that charter carriers be subjected to the same requirements as common carriers with respect to accounting and reports. He also presented a serious objection to the provision in the bill requiring two operators on buses having a capacity of 20 or more passengers, saying that without adding anything to the safety of operation such a requirement would add $91,000,000 to the cost of bus operation, and the limitation of the period of service of operators to eight hours a day. He said that figure had been "picked out of the air" without consideration of what would be a reasonable period and pointed out that because of layovers many operators may be on duty ten or eleven hours without being at the wheel for more than three or four hours.

Mr. Russell also urged that provision be made for consideration of existing service by other forms of transportation, including railroads, in determining whether a commission shall issue a certificate for a motor vehicle service. Senator Couzens remarked that it was his purpose in introducing the bill to provide for competition with railroad service and asked if the Interstate Commerce Commission is not inclined to be "railroad minded." "I wish I could find that so," replied Mr. Russell. When Senator Brookhart referred to the old charge that the railroads had put the waterways out of business he said that if a commission had been authorized in those days to decide such questions that would not have happened.

Ward Guthrie, representing 167 independent short line railroads that had replied to a questionnaire, testified on March 14, in general support of the bill, but to urge amendments which would require truck operators to observe minimum rates and classification requirements. He said that many short lines have lost a large part of their business to buses and trucks and have to some extent engaged in bus operation themselves, but hesitates to engage in truck operation because of the chaotic state of competition in that business. He cited many examples of truck operators quoting different rates to different shippers and disregarding published tariffs in such a way that a railroad cannot meet competition because it does not know what it is. He emphasized that truck operators which enter a field and demoralize a rate situation by cutting rates because of the keen competition have no responsibility for maintaining a reliable or dependable service and often abandon a field which they have found unprofitable.

R. B. Campbell, general manager of the Arkansas Valley Electric Railway, testified on March 15, on behalf of the American Short Line Railroad Association, expressing general approval of the Flynn report and strongly urging a system of regulation of motor vehicle transportation to eliminate the chaotic situation presented by competition between two forms of transportation, one regulated and the other not. He said he was not asking for an unreasonable degree of regulation of motor transportation but enough to prevent "ruinous" competition, and said that regulation would protect a reliable, dependable truck operation as well as a railroad. When he urged that the provisions in the bill relating to holding companies be treated separately instead of being mixed up with a bill to regulate motor transportation, Senator Couzens said he would be perfectly willing to begin hearings on holding companies at once and stop hearings on the bus bill.

Automatic and Remote Control Applied to Junction Interlocking on G. N.

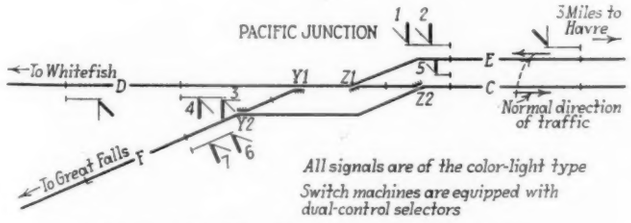


Looking East Toward the Double Track

Marks significant advance in scope of automatic interlocking—Effects return of 146 per cent on investment in additional control equipment

THE Great Northern has successfully demonstrated the extensive applicability of automatic interlocking in a unique installation near Havre, Mont. This road, a pioneer in this phase of signaling, has within the past few years applied automatic control to numerous grade-crossing and gauntlet interlockings. Now it has shown that the advantages of automatic interlocking can be secured at more complicated track layouts than was formerly considered possible.

At Pacific Junction, Mont., four miles west of Havre, an automatic-and-remote type of control has been substituted for a four-lever table interlocker, to control two crossovers and seven signals at the junction of two single-track lines converging into double track. Four of the eight routes at this junction are now entirely automatically controlled through approach track circuits, while the remaining four routes, only one of which is a regular movement, are controlled manually by the dispatcher at Havre.



Four of the Five Regularly Used Routes are Automatically Controlled

The principal changes from the former to the present system consisted merely of sustituting the automatic and remote control equipment for the table interlocker, and adding dual selectors to the switch machines, which were already in use. The cost of these changes was $3,700, bringing the total investment in the plant, as it now stands, to approximately $14,000. The saving effected is $5,400 a year, a return of 146 per cent on the investment in the new facilities.

Operating Conditions

Havre is an important division point on the Great Northern's transcontinental line between St. Paul and Seattle, and is the eastern terminus of the line to Great Falls, Billings and Butte, which leaves the main line at Pacific Junction, as shown on the track diagram. All trains running over the Great Falls line leave from or enter Havre. Approximately 18 trains pass through Pacific Junction each 24 hours, 8 of which move to or from the Great Falls line.

In 1925, automatic signals were installed from Havre westward through Pacific Junction. At that time, and as a part of that program, a four-lever table interlocker was installed in the Pacific Junction station, to control the switches and signals shown on the track diagram of the existing installation. This type of control was installed because 24-hour telegraph service was maintained at this point and the operators were available for handling the interlocking machine. It was later decided that telegraph service at the junction was not required, and it was necessary, therefore, to provide

other means of handling this particular interlocking plant.

The advantages of automatic control were apparent, but it was obvious that such a plan would necessarily have to be supplemented by some special type of control for certain routes. For example, from Havre to Whitefish is a normal westward movement, and therefore the signals for this route could easily be arranged for automatic track-circuit control. However, from Havre to Great Falls is a normal westward movement, also, and therefore some provision had to be made for distinguishing between these two routes. In view of these special requirements, a composite form of automatic and manual control was selected as the most practicable under the given conditions and was substituted for the table interlocker originally installed.

Automatic and Remote Control

With one exception, all of the regular movements are now lined up entirely automatically through the approach track circuits. The exception is the Havre-to-Great Falls route, which must be established manually by the dispatcher at Havre. The remaining three of the four remote-control routes are used only infrequently, and thus it will be seen that very little of the dispatcher's time and attention are required for the operation of the plant. This was the important factor in deciding upon a part-automatic type of control, as against a full-manual remote-control installation, despite the fact that the latter would have provided slightly greater flexibility.

The accompanying table, together with the track and signal plan, shows how each route is controlled. The automatically controlled routes are: Havre to Whitefish, on either main track; Great Falls to Havre, on the normal main; and Whitefish to Havre, on the normal main. These routes are automatically established upon the approach of a train on any one of the respective approach track sections, provided, of course, that conditions are such that the corresponding signal can safely be cleared. The routes which are controlled manually are: Whitefish to Havre, on the reverse main; Great Falls to Havre, on the reverse main; Havre to Great Falls, on the reverse main; and Havre to Whitefish, on the reverse main. These routes can be cleared only by the dispatcher properly manipulating the lever of a one-unit table interlocker and either of two push-buttons. It is of interest to note here that only three control wires were required between Havre and Pacific Junction, in order to effect this remote-control feature.

Table Showing How the Various Routes Are Controlled

Direction	Type of Control
E to D	Entirely automatic
C to D	Entirely automatic
F to C	Entirely automatic
D to C	Entirely automatic
E to F	Dispatcher
C to F	Dispatcher
F to E	Dispatcher
D to E	Dispatcher

Preferred Moves Are Anticipated

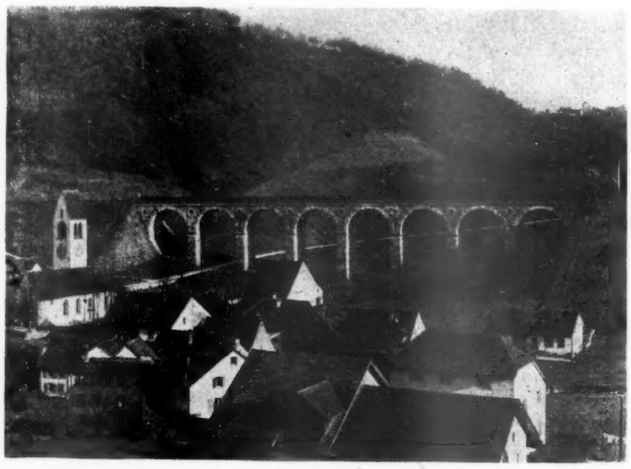
Provision has been made for directional preferences to be granted automatically when the nature of conflicting movements is such that the first train to secure the line-up should not proceed. As an example, suppose that a westbound train, having an order to meet an eastbound train on the double track, approaches signal *1* before the eastbound train approaches signal *3*. The westbound train has caused signal *1* to clear, but this train is compelled by train-order to stop and wait for the eastbound train. When the latter approaches signal *3*, the lineup is automatically transferred from the westbound train to the eastbound train. This same control feature applies to moves from *E* to *F* and from *F* to *C*, when the same type of double-track meet is to be made.

An Example of Operation

Five push-buttons, housed in a box locked with a switch padlock, and located midway between switches Y1 and Z1, are used for breaking down a line-up which for some reason is not wanted after it has been established. As an example of their use, consider the following: An eastbound freight train enters section *F* before an eastbound passenger train enters section *D*. The freight train has orders to permit the passenger train to precede it to Havre, but the freight train, by reason of its earlier approach to the plant, has already cleared signal *6*. Under these circumstances, a member of the freight-train crew would, immediately after his train had pulled up to signal *6*, operate a specified push-button, thus causing signal *6* to assume the Stop position and signal *3* to clear for the passenger train. Another push-button is provided for the purpose of enabling the dispatcher to put signal *1* at Stop, and clear signal *2* after a train has entered track section *E* and thereby automatically cleared signal *1*. Under these circumstances this push-button would be held down by a trainman while the dispatcher operated his remote-control apparatus.

The power for the dispatcher's control circuits is taken from a 110-volt 60-cycle a-c. source, and is transformed and rectified to 14 volts direct current. The control circuits are of the direct-wire polarized-relay type. No change was made in the location of the signals, which are of the color-light type. The General Railway Signal Company Model-5 20-volt switch machines used in the former plant were retained, but with dual-control selectors added. No lock-rods are used, but each switch point has its own switch circuit controller. The power for all functions is furnished by Exide KXHS-7 storage batteries on a-c. floating charge through copper-oxide rectifiers, the power for charging being taken from a 220-volt 60-cycle line. The original plant, as well as the changes described in this article, was designed and installed by the Great Northern's signal forces.

* * *



Courtesy Swiss Federal Railroads

The Rumlinger Viaduct on the Old Hauenstein Line of the Swiss Federal Railroads, near Basle, Switzerland

Bill To Regulate Railroad Ownership Is Opposed

WASHINGTON, D. C.

ENACTMENT of some of the provisions of the Rayburn bill, recommended by the Interstate Commerce Commission, to increase greatly the commission's jurisdiction over acquisitions of control of railroads, would have a disastrous effect on railroad securities, according to testimony before the House committee on interstate and foreign commerce this week by Herbert Fitzpatrick, vice-president and general counsel of the Chesapeake & Ohio and Pere Marquette and vice-president of the Missouri Pacific, and by Mark W. Potter, formerly a member of the Interstate Commerce Commission. Both objected to the proposal to make the commission's consolidation plan the criterion for all acquisitions and both objected especially to the proposal that the commission be given power to decide under what circumstances individuals, investment companies, or trustees shall hold railroad stocks.

Instead of being referred to as a "holding company" bill, Mr. Fitzpatrick said, it would better be described as a bill for the control of all stockholding in railroads whether personal or corporate, and as an effort, for the first time in railroad regulation, to tell an individual what he must not do as to things in no way affecting interstate commerce. Under it, he said, any individual could be called before the Interstate Commerce Commission and told to dispose of his securities on the ground that his holding of them was in interference with the plan, and he asked that serious consideration be given before "such a shadow" is cast upon the railroad security situation.

Mr. Fitzpatrick said that while the consolidation provisions of the transportation act apply to carriers and the word "unification" is not mentioned, the bill would change the entire policy of that act by attempting to control a corporation which is not a carrier or an individual, so far as acquisitions of control of carriers are concerned. Congress heretofore has legislated as to corporate entities, but the bill would make it unlawful for individuals to participate in the acquisition of control of two or more carriers, regardless of the purpose and even though competition between the roads might be impossible.

The so-called holding companies, such as those of the Pennsylvania and Van Sweringen interests that have been so much discussed in connection with the bill, he said, are not operating companies, but are only stockholders and investment companies rather than holding companies in the sense in which that term is usually used. If it be said that the Allegheny Corporation controls the Chesapeake & Ohio, the Nickel Plate and part of the Erie, he added, that means that it is a stockholder and no more and he pointed out that most of the holdings are in conformity with the commission's consolidation plan. So far as he was advised, he said, the stocks held by the holding companies are not held in opposition to the plan, but are held pending the commission's decision on application for modification of its plan. There can be no such thing as a unification through holding companies, he said, but the word has such a loose legal meaning that it has been used to confuse the issues and to confuse common ownership with consolidation. There is no good reason, he declared, why an individual should not have an interest in more than one system and for many years eastern roads have had interests in western roads without baneful effects.

Mr. Fitzpatrick said that it is admitted that the present consolidation provisions need to be improved and simplified, as proposed in the Parker and Fess bills, but that the pending bill proposes no constructive things but merely adds to the difficulties involved in carrying out the national consolidation policy.

Mr. Potter testified in opposition to the bill on March 15, saying it was a proposal to decide who shall own a railroad, or, in principle, an industry, rather than a regulation of commerce, and that its passage would have a disastrous effect on railway credit and property values. Mr. Potter, who said he was appearing as a stockholder and for certain holding company interests, said the bill represents an idea advanced by Commissioner Eastman as long ago as 1920 that Congress had intended to give the commission complete control over the consolidation of railroads but that the commission had held that it had no jurisdiction over holding companies and in the Nickel Plate unification case had held that Congress had not intended to give it jurisdiction over a consolidation effected under state laws.

Referring to the impression that has been created in many minds that railroad holding companies are violating some law, Mr. Potter said the commission had held in 1920 that the Western Pacific holding company could acquire control of the Denver & Rio Grande without coming to the commission for approval and he said that the Pennroad Company and the Allegheny Corporation had a perfect right to acquire stock of railroads. Mr. Potter agreed that Congress has power to say whether two railroads shall be consolidated, but he said that was not the issue in the bill and that there was a great difference between consolidation and common control which does not necessarily imply interference with operation.

Mr. Potter also said that false ideas generated by the consolidation provisions of the laws were to blame for a large part of the troubles of the railroads and that Congress should repeal the consolidation provisions and amend Section 5 of the act to give the commission power to require the railroads to divide traffic and earnings. This, he said, would solve the railroad problem by eliminating wasteful competition and reducing costs.

J. J. Pelley, president of the New York, New Haven & Hartford, and George D. Ogden, vice-president in New England of the Pennsylvania, testified on March 16 to deny statements made recently before the committee by L. R. Wilder, representing the city of Boston, that the Boston & Maine is not permitted to solicit traffic in certain territory in competition with the New Haven and that Mr. Ogden had said at a conference with Mr. Wilder in December that the Pennsylvania "dominated" New England. Mr. Pelley said that each road is free to solicit business anywhere under its own management and without hindrance, and he denied that New England railroad executives are "gagged" and silenced as to discussion of the New England situation in connection with consolidation. He said the Pennsylvania had long had an interest in the New Haven which had been increased in recent years and that the companies are natural allies, but that the Pennsylvania has not interfered in the New Haven management and has but one representative on its board whereas its stockholdings would entitle it to four.

THE RAILROAD AND WAREHOUSE COMMISSION OF MINNESOTA, during October, November and December, ordered railroads in that state to make eight additional grade crossings. During the same period it denied three petitions for crossings.

Revision Improves Design of Fence Posts

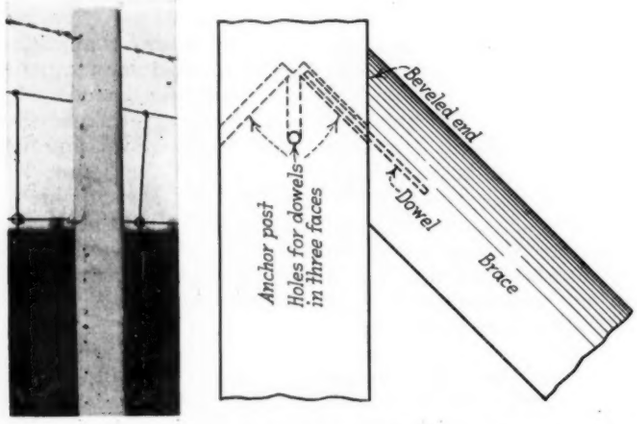
A REVISED design of concrete fence post to increase its length while at the same time reducing both the section and weight; to provide a new method of attaching the wires; and to permit greater ease in handling, has been developed by the Pendergast Company, Marion, Ohio. This design retains the triangular section of the older posts, but eliminates the bulb or enlargement, which was placed at the lower end, and the stapling strip of cinder concrete, which were features of the former design. It is said that tests made in accordance with American Railway Engineering Association specifications demonstrate a strength in excess of that specified.

The standard length of the posts for ordinary right-of-way fence is 7 ft. 6 in. and posts of this length weigh 50 lb., although any other length can be furnished if desired. For station and shop grounds a malleable iron bracket is provided, which will support three barbed wires at an angle of 45 deg. from the top of the post, and which can be used with either standard fencing or chain link fabric.

Holes are provided at intervals of two inches for a distance of 4 ft. 6 in. from the top to facilitate the attaching of the fence wires. To make this attachment, a soft wire is drawn through the hole and twisted around the line wire to tie it firmly to the post. This permits the use of any combination of woven fencing and barbed wire, since there is a tie-wire hole within an inch of every line wire.

Anchor posts and diagonal braces are also furnished. The former has a square section, is 8 ft. 10 in. long and weighs 270 lb. The latter has a D-section, is 8 ft. long, weighs 100 lb. and has a dowel projecting from its beveled top. The beveled top of the brace insures a neat bearing against the anchor post, the dowel entering a hole provided for it in any one of three faces of the anchor post so that the latter can be used interchangeably for corner, end or brace panels, or as a gate post. Each of these units is designed to be set with its lower end in concrete.

Aggregates are proportioned by weight, the water is controlled mechanically and the reinforcing is of the self-spacing type. Steel forms are used to mold the posts and they are kept under vibration as the concrete is placed, every effort being made to produce as dense a concrete as practicable.



Left: The New Fence Post With the Holes for Wire Connections —Right: Detail of the Connection of the Brace to the Anchor Post

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended March 5 amounted to 559,439 cars, an increase as compared with the week before which included a holiday but a decrease as compared with the week ended February 20. Although there was a considerable decrease in the loading of coal, 33 roads showed the highest loading for any week this year. As compared with the corresponding week of last year the total loading showed a decrease of 163,776 cars, and as compared with 1930 there was a decrease of 314,277 cars. As compared with the week of February 20 there were reductions in the loading of grain, livestock, coal, coke, and ore, but increases in the loading of forest products, merchandise, and miscellaneous freight. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, March 5, 1932

Districts	1932	1931	1930
Eastern	131,020	164,309	199,190
Allegheny	113,118	149,656	178,589
Pocahontas	32,972	40,785	48,449
Southern	86,940	114,927	140,667
Northwestern	63,330	87,771	107,579
Central Western	83,929	106,190	126,099
Southwestern	48,130	59,577	73,143
Total Western Districts	195,389	253,538	306,821
Total All Roads	559,439	723,215	873,716
Commodities			
Grain and Grain Products	31,373	41,553	40,984
Live Stock	16,952	18,439	23,545
Coal	95,367	129,123	144,698
Coke	5,084	7,970	10,107
Forest Products	20,488	34,024	58,020
Ore	2,096	5,344	8,137
Mdse. L.C.L.	191,498	220,467	250,348
Miscellaneous	196,581	266,295	337,877
March 5	559,439	723,215	873,716
February 27	535,498	681,221	899,498
February 20	572,606	713,156	827,560
February 13	562,465	720,689	893,140
February 6	574,756	719,053	886,701
Cumulative total 9 weeks	5,074,639	6,430,545	7,851,412

Car Loading in Canada

Car loadings in Canada for the week ended March 5 showed an increase over the previous week of 923 cars in the eastern division, but in the western division there was a drop of 2,106 cars. This was undoubtedly due to heavy snow and rain in the mountains and the cold and snow on the prairies. Total loadings amounted to 42,262 cars, which was 1,183 cars less than for the previous week and 5,497 cars less than for the ninth week last year.

The eastern division almost maintained the normal seasonal increase, the index number being 72.52 as against 72.75 the previous week, but the drop in the western division lowered the index number for total loadings from 75.78 to 70.98.

Merchandise loading showed a gain of 656 cars, 560 cars in the eastern division and 96 cars in the western division, and the index number rose from 86.47 for the seventh week to 88.05 for the eighth week and to 88.37 for last week. Loadings, however, were well below last year's, the decrease for the week being 1,339 cars, 877 cars in the east and 462 cars in the west.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
March 5, 1932	42,262	23,093
February 27, 1932	43,445	21,311
February 20, 1932	42,593	22,611
February 28, 1931	47,759	28,001
Cumulative Totals for Canada		
March 5, 1932	369,098	190,144
February 28, 1931	412,436	244,957
March 1, 1930	501,975	328,836

A. R. E. A. Holds Its Thirty-Third Convention

L. W. Baldwin
President

Two-day meeting at Palmer House marks completion of an unbroken record of annual gatherings at Chicago for a third of a century

J. V. Neubert
President-Elect

FOR the thirty-third consecutive year the American Railway Engineering Association held its annual convention in Chicago. In accordance with the action of the board of directors, this meeting, which was held at the Palmer House, was limited to five sessions, three on Tuesday, March 15, and two on Wednesday, instead of the three-day conventions which have been held every year up to and including 1930. In lieu of an annual banquet, which was dispensed with, a luncheon was given on Wednesday noon for the members of the A. R. E. A. and the National Railway Appliances Association and their guests, at which time Claude R. Porter, chairman of the Interstate Commerce Commission, was the principal speaker. The registration totaled 546 members and 211 guests.

President Baldwin's Address

The meeting was called to order by President L. W. Baldwin, president of the Missouri Pacific, who read a brief address in which he congratulated the various committees on the high character of the work they had done in the face of the adverse conditions that confronted them during the past year. While touching on the importance of directing the work of the committees at this time to the urgent needs of the present, he expressed an optimistic outlook for the future, calling attention to the fact that the association has continued its activities through 10 periods of depression, of which four were of a major order. In the meantime, he continued, it is important that all members use the valuable information developed through the work of the association in furthering the conduct of railway transportation with the maximum of economy. The railways have been criticised for extravagance, and it is by avoiding any opportunity for valid accusations on that score and by taking advantage of every opportunity to aid in the development of a correctly informed public that the individual members can be of utmost assistance in the maintenance of adequate railway transportation.

According to the report of Secretary E. H. Fritch, the membership on March 1, 1932, was 2,723, a net loss of 68 during the past year. The receipts exceeded expenditures by $15,331.92. The principal saving, according to the report, was effected in printing costs, due in considerable part to a reduction in the size of the reports offered by the different committees.

Uniform General Contract Forms

F. L. Nicholson, Chairman*

The committee presented reports covering five subjects as stated in the following appendices, wherein is also given the action recommended in each case. Under Appendix A, Revision of Manual, no changes were recommended this year.

Appendix B—Agreement for the Purchase of Electrical Energy in Large Volume

In a report which was presented as a progress report with the recommendation that the subject be continued, the committee stated that a tenative draft of an agreement had been prepared and submitted to the committee on Form for Power Contract for Large Blocks of Power, of the Electrical section, for criticism and suggestion. Following review by this committee, a revised draft of the agreement was prepared and dated July 8, 1931, based on the suggestions of the Electrical section. The committee stated that the revised draft was now in the hands of the Electrical section for further criticism or approval and that it had also been submitted to the Railway Electrification committee of the National Electric Light Association for the same purpose.

The report included the full text of the form of agreement, together with an index, which listed the following main divisions or articles: Term of agreement; obligations as to supply and purchase; character of service; character of load; points of delivery; rates and payments; metering; interruption; default and termination; reduction in rates; arbitration; and general.

Action.—The report was presented by Subcommittee Chairman W. H. Brameld (Erie) as a progress report. E. R. Lewis (M.C.) took exception to the report on the ground that the agreement lacked clarity, and urged that the committee study it with a view to greater brevity. Mr. Brameld replied that the agreement had not yet been put in final form and that the committee would consider the suggestion.

Appendix C—Agreement for the Organization and Operation of a Joint Passenger Terminal

The committee submitted a final draft of a form of agreement for the organization and operation of a joint passenger terminal project and recommended that it be adopted as recommended practice and published in the Manual. It pointed out that following its first presentation of the form at the convention in 1930, the committee had accepted a number of

* Chief Engineer, Norfolk Southern

helpful suggestions from the Committee on Yards and Terminals, which brought both committees into agreement on the form now presented.

The form submitted for adoption is divided into two main parts. The first part, or "Organization Agreement," provides for the creation of a railway company to operate and maintain the terminal, and the construction and method of financing of it, while the second part, or "Operating Agreement," is of such a nature that it can be fully executed only after the terminal company has been legally created and has authorized its officers to execute it. The committee pointed out that both parts of the agreement must be considered at the same time as constituting one complete agreement.

Action.—The report was presented by Subcommittee Chairman W. G. Nusz (I.C.) and was approved for publication in the Manual.

Appendix D—Conveyance of Title in Connection with Air-Right Development

Charged with the preparation of a form of conveyance of title granting the right to construct and maintain air-right buildings over railway property, and more particularly, a standard form of deed for the conveyance of air-right structures over such property, the committee canvassed the railway field to ascertain past practice and to secure copies of conveyances of air-rights, both deeds and leases. With this information in hand, the committee prepared a general introductory statement relative to air-rights and air-right transactions, which it offered as information.

Appendix E—Agreement for Pipe Line Crossings Under Railway Tracks

In a progress report, the committee stated that after collecting copies of existing forms on the railways covering pipe line crossings, it had prepared a tentative general form which is now in the hands of the Committee on Water Service and Sanitation for its consideration. It also reported that contact had been made with the American Petroleum Institute to ascertain its views. It was recommended that the subject be continued.

Iron & Steel Structures

A. R. Wilson, Chairman*

The committee reported briefly on the Revision of Manual (Appendix A), and the use of copper-bearing steel for structural purposes (Appendix B). It recommended that Appendix A be received as information and that the conclusions presented in Appendix B be approved for publication in the Manual.

Appendix A—Revision of Manual

The committee reported that the General Specifications for Steel Railway Bridges, Fourth Edition, were issued under date of May, 1931, which included all revisions adopted by the association to the date of issue. Also, that in accordance with plans of the Board of Direction, an index covering the work of the Committee on Iron and Steel Structures had been completed and submitted to the secretary of the association.

Appendix B—Copper-Bearing Steel for Structural Purposes

After referring to previous work of the association on this subject, the committee offered the following as a result of recent studies which it has made:

Information recently collected from some of the large manufacturers of steel indicates a continued demand for copper-bearing steel for structural purposes, and the production of a substantial tonnage of such steel during 1930. Reports received also show that five of the largest eastern railroads are specifying copper-bearing steel for many railway bridges, and that certain cities and counties specify copper-bearing steel for highway bridges.

The committee recommended that the following conclusion be approved for publication in the Manual:

From results of exposure and service tests on the use of copper-bearing steel, we recognize its value as a rust-resisting metal and recommend its use in railway steel structures exposed to corrosive influences.

Action.—In the absence of Subcommittee Chairman F. P. Turner (N. & W.) the report was presented by W. S. Lacher *(Railway Age)* and the conclusions were approved for publication in the Manual.

* Engineer of Bridges, Pennsylvania

Wooden Bridges and Trestles

H. Austill, Chairman*

The committee gave consideration to the six subjects of the following appendices and to revisions of the Manual. It also reported progress on the subject of the design of standard wooden trestles for heavy loadings.

It recommended that no changes be made in the Manual; that the conclusions 1 to 12, inclusive, Appendix C, be adopted for publication in the Manual and that the subject be discontinued; and that appendices B, D, E, F and G be received as information and the subjects continued.

Appendix B—Simplification of Grading Rules and Classification of Timber

Owing to conditions in the lumber industry, the committee reported that no important work in grading rules has been done by the associations of manufacturers of lumber. Activities of these associations have been along promotional and trade extension in a time when the problems of sales and control of output were most pressing for attention. Activity in the further development of grading rules has been suspended for the present.

The committee stated that a special assignment of collaboration with the Mechanical division, A. R. A., on grading rules for car lumber and timber, is before it, but no conclusions have been reached as yet.

Appendix C—Standardization and Simplification of Stocks and Disposition of Obsolescent Material

Following a statement that the committee feels that a more general use of the sizes and lengths of timbers shown on the adopted plans of the association for timber trestles would result in the simplification of manufacture of bridge timbers, and, in turn would affect the simplification of storehouse stocks and permit the reduction of such stocks, the report presented a number of suggestions to bring about the simplification of stocks and then offered the following conclusions:

(1) Materials of the same size for ties and for guard timbers should be used on steel bridges and timber trestles, where the design will permit. This would also be applicable to the hardware.

(2) Timbers of the same cross-section should be used in open-deck and ballast-deck trestles, where both types are in use on a railroad; also, timbers of standard cross-section should be used for sills, caps or posts of frame trestles and other structures where the lengths cannot be standardized.

(3) Sizes of material for timber trestles should conform as nearly as possible to the standard commercial sizes adopted as the American Lumber Standards.

(4) Treated pile stubs should be used for foundations of buildings, eliminating the necessity of carrying stocks of timber for this purpose.

(5) Suitable obsolete timber or timbers of odd sizes should be used for mud blocks for frame trestles, platforms, buildings, crib walls, platform curbs and concrete forms. In some cases, it may be advisable to re-work such timber into smaller sizes.

(6) Lumber rejected for other purposes may be used in temporary construction.

(7) When a certain size or class of untreated timber or piling is overstocked; it may be found to be more economical to give it a light treatment for preservation of the sapwood than to attempt to dispose of it or re-work it.

(8) Emergency stocks of timber carried at points other than general supply yards should be treated.

(9) Plans should be prepared with a view of eliminating material which is not standard stock. This is especially important for treated material which must be seasoned before treatment.

(10) The engineering and maintenance departments should examine stock lists periodically and, when special material is to be ordered, determine if substitutions can be made from stock.

(11) The engineering and maintenance departments should keep the store departments informed as closely as possible on future requirements.

(12) Store departments should advise all departments concerned of special stocks or overstocks of materials.

(13) Co-operation of all departments, such as bridge, building and mechanical, with a view of reducing the number of standard sizes and grades of timber.

Action.—S. F. Grear (I.C.), subcommittee chairman, pre-

* Bridge Engineer, Mobile & Ohio

sented the report and his motion that the conclusions be adopted for publication in the Manual was carried.

Appendix D—Overhead Wooden or Combination Wooden and Steel Highway Bridges

The work of the committee for the last year was confined to the study of the practical application for the plans presented in its report for 1931. Plans were presented to and favorably commented upon by several state highway bridge engineers. Suggestions offered by the highway engineers are being considered in connection with the proposed revision of typical plans.

In order that the members of the association might fully appreciate the type of construction under consideration, the committee offered pictures of bridges constructed in central Kansas during 1931 substantially in accordance with the typical plans which it presented last year.

Action.—The report was presented by Subcommittee Chairman R. P. Hart (M.P.), who was asked by B. R. Leffler (N.Y.C.) why it was necessary to provide longitudinal sway bracing in the overhead highway bridges illustrated in the report. He contended that structures no higher than these were afforded adequate longitudinal stiffness by the staying action of the buried end bents. Mr. Hart replied that this bracing was needed because the fill was applied after the bridges were built and because of the heavy winds experienced in Kansas where these bridges are located.

Appendix E—Relative Merits of Concrete and Treated Wooden Trestles

The committee pointed out the difficulties with which it is confronted in trying to reach more specific conclusions than those already adopted by the association, mainly, the lack of pertinent detailed and specific data in the records of the carriers, and the necessity of predicting the average length of useful life of long-lived structures. In the hope of some measure of success in its undertaking, it intends to continue its work.

Action.—Chairman Austill read a letter from Arthur Ridgeway (D. & R.G.W.) subcommittee chairman, which comprised a plea for information from the railways on service life, without which no adequate report is possible.

Appendix F—Bearing Power of Wooden Piles and Best Methods of Determination

The committee pointed out that there are two methods available for determining the safe bearing value of piles; the use of a formula based on the behavior of the pile in driving, and the use of test loadings. It then reviewed past study of this subject, including the mathematical discussion offered in 1902 by Ernest P. Goodrich, and the Wellington formula, and in conclusion said as follows:

In view of the large amount of work which has been done on this subject by previous investigators, it is felt that any attempt to develop a new formula by original methods is uncalled for and that such an attempt would accomplish no results of practical value.

Appendix G—Relationship Between the Energy of Hammer and Weight or Mass of Pile

In order to obtain information from actual pile driving operations, questionnaires were sent to members of the committee and the data received were presented in Exhibit A. From this information it appears that the railroads make general use of two sizes of hammers; light types for wood and short concrete piles, with a rated gross energy varying from 7,260 to 9,650 foot-pounds, and heavier types with a rated gross energy of 15,000 foot-pounds for concrete piles 30 ft. to 40 ft. long.

In two instances still heavier types were reported, one for driving 60-ft. concrete piles and the other for driving 67-ft. concrete piles. In these cases, hammers were used having rated gross energy of 22,080 and 24,375 foot-pounds respectively. In some cases water jets were used, and in all cases a cushion was provided on top of concrete piles.

The following conclusions were presented as information:

(1) The hammer should be as heavy as possible without undue damage to a properly cushioned pile.

(2) For average driving conditions, all kinds of piles, the rated gross energy of the hammer in foot-pounds should be twice the weight of the pile.

(3) For soft driving, to rock, from one to two times the weight of the pile.

(4) For hard driving, from two to three times the weight of the pile.

Report on Clearances

A. R. Wilson, Chairman*

As its report this year the committee presented clearance diagrams for platforms which it designated Fig. 4 and 5. These diagrams continue the series that the committee plans to add to from time to time, and supplement Figs. 1, 2 and 3 and Paragraphs (a), (b), (c), (d) and (e), which were adopted by the association in March of last year and printed in Bulletin 337, Revisions and Additions to the Manual, Page 109.

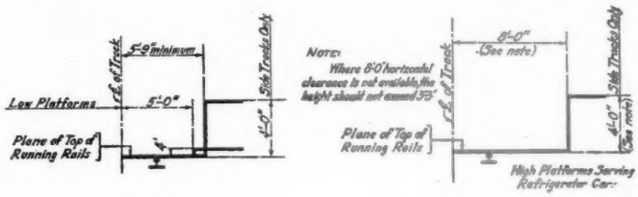


Fig. 4 Fig. 5

Clearance Diagrams for Platforms

The committee recommended that clearance diagrams, Fig. 4 and 5, be approved, and the revisions substituted for the present recommendation in the Manual, and, furthermore, that Paragraphs (a), (b), (c) and (d), above referred to, also be made to apply to Figs. 4 and 5.

Action.—The report was presented by Chairman Wilson and the recommendations were adopted for publication in the Manual.

Report on Electricity

S. Withington, Chairman†

Following the precedent set last year, the report of the committee was confined to a synopsis of the detailed reports made to the Electrical section, A.R.A. and reprinted in full in Bulletin 338, August, 1931. This synopsis, which it was recommended be accepted as information, is as follows: (2) Inductive Co-Ordination—Co-operation has been continued with the two Joint General Committees on Inductive Co-ordination of the American Railway Association and the National Electric Light Association, and the American Railway Association and the Bell System. Work is progressing on the formulation of "principles and practices."

(3) Power Supply—An exhaustive report was presented on (a) steam power available for traction and general power purposes; (b) water power available for traction and general power purposes; and (c) internal combustion engine power supply. The report also contained interesting statistics on electric energy purchased and manufactured by steam railroads, and the capacity of generators installed in public utility power plants in the United States.

(4) Electrolysis—The study of electrolysis, with a view of including a description of the measures taken to mitigate electrolysis in connection with the Cleveland Union Terminal and the D. L. & W. electrification, has been continued, and report is made on the steps taken in connection with the Cleveland Union Terminal electrification.

(5) Co-operation in Miscellaneous Regulations—The negotiations with the National Electric Light Association in the preparation of "principles and practices" for power wire crossings over railroads, with accompanying specifications, have been continued. Also, the formulation of "principles and practices" concerning crossings between railway lines and electric power lines.

(6) Overhead Transmission Line and Catenary Construction—The committee has considered the preparation of typical pole line construction diagrams with a view to standardization, but has postponed action. Tentative specifications for copper and bronze trolley wire have been submitted as information.

(7) Economics of Railway Location as Affected by Electric Operation—Reference is made to a report of a concrete example to illustrate the application of a theory regarding the selection of electric switching locomotives, prepared by the Committee on Economics of Railway Location, A.R.E.A.

(8) Standardization of Insulating Tape—Specifications for black varnished cloth tape—straight and bias cut, were presented.

(9) Standardization of Insulators—The committee has kept in touch with developments in connection with specifications

* Engineer of Bridges, Pennsylvania

† Electrical Engineer, N. Y., N. H. & H.

for porcelain insulators for railroad supply lines, but no changes are proposed at this time.

(10) Protection of Oil Sidings from Danger Due to Stray Currents—The rules with above title have been superseded by "Recommended Practice for the Protection of Tracks Used in the Loading or Unloading of Inflammable Liquids from Danger of Fire Caused by Electric Sparks."

(11) Specifications for Track and Third-Rail Bonds—Proposed Specifications for stud terminal copper rail bonds are presented. Study has also been given to the contact areas and resistances of welded bonds.

(12) Illumination—The Incandescent Lamp standards have been revised and amplified. Floodlighting of railroad yards is reported on and specifications for large tungsten filament incandescent lamps were submitted.

(13) Design of Indoor and Outdoor Substations—Under this heading, report is made on (a) substation insulation; (b) working clearances; and (c) relay protection.

(14) High Tension Cables—Progress is reported on the preparation of specifications for high tension cables.

(15) Application of Corrosion-Resisting Materials to Railroad Electrical Construction—The samples for corrosion tests installed at the Cedar Hill enginehouse, New Haven, have been under observation and report on their behavior will be made later. Additional samples have been installed in the Hemphill tunnel and are to be installed in the Lambert's Point pier on the Norfolk & Western in the near future.

(16) Form of Power Contract for Large Blocks of Power—Progress is reported on the collaboration with the Committee on Uniform General Contract Forms, A.R.E.A., in the preparation of a form of agreement for the purchase of electrical energy in large volume.

Action.—After the presentation of the report, the question of publishing an index of the Electrical Section manual in the A. R. E. A. Manual was referred to the board of direction on a motion of D. J. Brumley (I.C.). R. P. Winton (N. & W.) explained the scope and character of the corrosion tests that are under way, and W. L. Morse (N.Y.C.) discussed the work that is being done to protect transmission lines and tall structures near airports and along air routes from damage by airplanes.

Signals and Interlocking

P. M. Gault, Chairman*

The committee presented reports as indicated in the following appendices, giving special attention to the subject of signal indications in lieu of train orders and timetable superiorities. It advised that, as directed, it had collaborated with the Committee on Grade Crossings in a study of developments in highway crossing protection, and with the Committee on Clearances in furnishing it information required by it pertaining to signals and interlocking.

It recommended that Appendix A be approved and that appendices B, C and D be received as information.

Appendix A—Revision of Manual

Under this head the committee requested authority to bring up-to-date the index of the Manual of the Signal Section, A.R.A., now appearing in the 1929 Manual of the association.

Appendix B—Automatic Train Control

In a brief report presented as information, the committee advised that there has been no marked change in the mileage and number of locomotives equipped during the year, and that the Bureau of Safety had completed its inspections and reports covering the various installations. It reported further that the Committee on Automatic Train Control, A.R.A., is continuing its study of the question of interchangeability, and then made reference to the equipping of locomotives during the year on the New Haven and the Boston & Maine.

Appendix C—Signal Indications in Lieu of Train Orders and Timetable Superiorities

The report of the committee this year dealt at some length with centralized traffic control (CTC). This subject was discussed under a number of heads including operation under centralized traffic control; "OS"ing trains; types and cost of CTC installations; total net savings of installations per year; and potential savings.

The CTC installations in use as of November, 1931, may be summed up as follows: (a) On both single and double track for the relief of traffic congestion through short or bottleneck sections, gauntlets or tunnels. (b) On 332 miles of single track for the purpose of postponing double-tracking, particularly in locations where the construction costs make double-tracking economically impossible. (c) On over 400 miles of multiple-track lines for either-direction operation on one or more of the tracks. (d) On multiple-track lines for the consolidation of interlocking plants, making one CTC station control two or more interlocking layouts.

The train miles per year through the 57 CTC installations totals 6,772,173 freight and 4,599,657 passenger-train miles. The I.C.C. Bureau of Safety Annual Reports for 1928, 1929 and 1930 show a total cost for CTC of $2,569,168 for a total of 686.4 miles of road, or an average cost per mile of $3,743, at this rate, the 57 CTC installations covering 979.9 miles of road show a total cost of $3,667,766. Owing to the intensive use of track facilities, locomotives and cars under centralized traffic control, transportation costs show a substantial saving. The saving in freight train service out-of-pocket costs reduces the costs per train mile and per 1,000 gross ton-miles.

Signal stations replaced by CTC represent a large part of the saving in transportation costs. The 106 stations taken out of service included train order, block and interlocking stations. At a saving of $5,000 per station per year, there is a gross saving per year of $530,000. From the results of many economic studies, a net saving, after all charges, of 20 per cent of the installation cost may be regarded as a conservative figure.

Centralized Traffic Control Installations in Use as of November, 1931

Railroads	No. of installations	Miles of Road: Single Track	Double Track	Total Miles	Power Switches	Signals	"OS" Points
AT&SF	3	27.1	19.7	46.8	28	121	27
B&O	3	101.3	1.6	102.9	65	249	62
B&G	1	16.0	..	16.0	2	49	15
B&M	11	4.8	154.2*	159.0	215	592	143
CP	1	9.0	..	9.0	2	18	4
CRR of NJ	1	..	4.4†	4.4	6	9	2
C&NW	2	8.5	..	8.5	5	25	9
CB&Q	7	55.0	15.5	70.5	70	170	50
CGW	1	1.6	..	1.6	2	6	2
CMStP&P / CRI&P	1	..	37.7	37.7	11	59	5
CRI&P	1	10.3	10.4	20.7	4	16	4
D&H	1	6.6	5.7	12.3	6	47	22
D&RGW	2	36.5	2.5	39.0	14	69	26
Erie	1	..	17.3	17.3	4	4	6
IC	2	4.2	15.0	19.2	11	66	10
LV	1	11.2	..	11.2	2	8	2
MP	4	54.5	44.5	99.0	49	243	70
NYC	1	36.9	3.3	40.2	32	102	32
N&W	1	8.5	..	8.5	1	9	2
Pad. & Ill.	1	15.0	..	15.0	13	30	7
Penna.	1	30.0	..	30.0	12	32	11
P&PU	1	..	7.1*	7.1	20	37	17
PM	1	20.0	..	20.0	8	34	8
SP	1	37.1	2.6	39.7	23	98	24
T&NO (SP)	2	23.0	..	23.0	10	59	11
T&P	4	4.2	80.1	84.3	32	197	24
Wabash	1	37.0	..	37.0	13	65	14
Totals	57	558.3	386.1	979.9	660	2,414	609
			31.1 three track				
			4.4 four track				

* = A part of this is on three-track.
† = Four track.

A potential saving may be of such a character that the amount of the saving can be definitely fixed; for example, 13 CTC installations with a total of 332 miles were made to postpone double-tracking. The cost of the double-tracking, based largely on railroad estimates, amounts to $18,888,500. The annual charges may be placed at $1,908,750.

Action.—In connection with the presentation of Appendix C, Acting Committee Chairman A. H. Rudd (Penna.) presented a short paper, illustrated by lantern slides, explaining the economic results effected by two typical installations of centralized traffic control on single track. On the 43-mile installation on the Missouri Pacific, where 48 trains have been handled daily, 50 per cent of the meets are non-stop, the average speed has been increased 47 per cent, and gross ton-miles per train-hour have increased 57 per cent. On the 29-mile installation of the Pennsylvania, handling about 30 trains daily, the average freight train speed was increased 87 per cent, or from 16 to 30.6 m.p.h.; the gross ton-miles per train-hour were increased 89 per cent, and the net return on the investment is 28 per cent. Furthermore a second-tracking program in this territory, estimated to cost $3,750,000, has been indefinitely postponed as a result of the increased track capacity effected by the centralized traffic control.

Appendix D—Current Activities of Signal Section

The report listed the investigations which the Signal Section has under way and the subjects upon which it is reporting. It also included lists of the specifications that have been revised and consolidated during the year and of new specifications that have been completed.

* Signal Engineer, Missouri Pacific Lines

Report on Yards and Terminals

H. L. Ripley, Chairman*

The report submitted by the committee this year covered the subjects of the following appendices. Progress alone was reported on its assignments covering the effect of motor coach and motor truck service on the design of way and terminal station facilities; clearances; and air ports.

The committee recommended that the revisions outlined in Appendix A be approved for publication in the Manual; that Appendix C be received as information and the subject held in abeyance for a year; and that appendices B, D, E, F, G and H be received as information and the subjects continued.

Appendix A—Revision of Manual

The committee recommended quite extended additions to the 1929 Manual under the general subject of freight yards. Under the caption Freight Yards—General, on Page 997, following Paragraph 9, it suggested adding the following:

To meet traffic requirements a yard should be able, even in peak periods, to receive trains promptly upon arrival, perform any auxiliary service (such as icing, feeding and watering stock, making running repairs, etc.), switch cars into their proper classifications without appreciable delay, and dispatch these cars in their proper position in the designated outgoing trains in a minimum of time.

On Page 1000, in place of Paragraph 47, it suggested substituting the following paragraph:

Ice house, stock pens, L. C. L. transfer, etc., should be so located that cars may be placed with minimum delay after arrival and be readily accessible for switching or placement in outbound trains.

On the same page, following Paragraph 50, it suggested adding a new heading "Hump Yards" with considerable detailed information covering the factors to be taken into consideration in deciding upon the construction of hump yards, the layout of tracks and gradients, and the location of the hump master's cabin.

Following this data it suggested another heading, Hump Yards with Car Riders, to head the matter on this subject already in the Manual, and then the insertion of another new heading Hump Yards with Retarders, followed by detailed matter covering the arrangement of classification tracks; the basic operating conditions to be considered in designing the gradients in a classification yard; the location of retarders; and such other factors as control switches, loud speaker telephone circuits, pneumatic tubes, teletype machines, yard lighting, the application of hot oil to car wheel journals during cold weather, and flange oilers to reduce car resistance.

Action.—The additional matter recommended by the committee was approved for publication in the Manual.

Appendix B—Produce Terminals

In a detailed report on this subject, the committee dealt at considerable length with existing large produce terminals, offering definite recommendations covering location, buildings, track layout, garbage and refuse disposal and live poultry platforms. In addition, it also included recommendations covering yard inspection platforms, driveways, building platforms, live poultry facilities, drainage, icing and scales, and a list of some of the more modern produce terminals of the country, together with a number of sketch plans.

Appendix C—Parking and Garage Facilities

The committee continued its study of auto parking, and this year gave particular attention to the design of layouts at or near railway stations, including joint developments made under co-operative agreements between public authorities, the railway company and other public interests. A large part of the report was taken up by the subject of design, which was accompanied by a series of sketches showing various parking arrangements for autos at railway stations.

The committee reported that the provision of garage facilities at stations by railway companies is not common and that it seemed that this class of service should more properly be taken care of by a concessionnaire or independent concern.

Appendix D—Hump Yards

Repeating, for emphasis, the caution that there are many factors affecting the efficient operation of a retarder yard, local to each situation, and that each terminal must be studied independently to produce a proper design, the committee offered tentative formulæ and methods of procedure as a guide in laying out the hump and yard gradients for a typical installation. It reported that experience has demonstrated the great advantage of the group track arrangement over the former ladder type track arrangement for retarder layouts, as regards both first cost and operating cost, and that the advantage of reduced length obtained by the use of lap switches, resulting in less hump height, more than compensates for any disadvantage there may be in a lap switch.

A considerable part of the report was taken up in the presentation of the formulæ, which the committee pointed out were intended to be used in designing retarder hump yard gradients from the crest of the hump to the lower end of the classification yard. The report included an explanation of the formulæ, their application and modification to meet special conditions, and also included an example worked out for a typical yard with 45 classification tracks, divided into groups of five tracks each.

*Construction Engineer, N. Y., N. H. & H.

Appendix E—Co-ordination of Facilities at Rail and Water Terminals

The committee reported that it had received 87 usable returns from 113 questionnaires sent out, 64 of these dealing with ocean ports, 19 with lake ports and 4 with river ports. It pointed out that since there is now a regular standing committee on rivers and harbors, a large amount of the data collected should be handled by that committee, and, therefore, with the approval of that committee, it recommended that the data collected on slip capacity and maintenance, open storage, merchandise piers, coal piers, ore docks, oil and gasoline docks, car ferry or car float slips, warehouses, grain elevators and other types of docks, be turned over to the Committee on Rivers and Harbors for handling.

The committee reported that a complete report of the preliminary analysis of the replies received to its questionnaire will be filed with the secretary of the association so that it will be available as advance information to anyone interested.

Appendix F—Scales

In the report to the 1931 convention, mention was made of the preparation of a detailed code of specifications for test weight cars, based on material now included in the Manual. Since the preparation of that report, a contact group has been formed, consisting of representatives of the committee, the Committee on Car Construction of the Mechanical division, A. R. A., and the originators of the specifications, the National Scale Men's Association.

Several changes in the original form were suggested and agreed to by the contact group, and the revised specifications were subsequently approved by the two committees and the originating association. As a matter of information, these specifications were included in the report.

Appendix G—The Bearing Value of Pivots for Scales

In its report the committee called attention to the difficulties encountered in the construction of pivots or knife edges of scales to preclude their crushing or breaking down under service, and pointed out the absence of experimental research to establish the safe loading values of scale pivots. It directed attention to the investigation of the bearing value of scale pivots completed recently at the engineering experiment station of the University of Illinois, and included in its report the conclusions arrived at as a result of that investigation.

Appendix H—Bibliography of Railway Stations, Yards, Marine Terminals and Airports

This appendix consisted of a bibliography of published articles, papers and books on passenger stations and terminals; freight stations and terminals; rail-and-water terminals; and airports and rail-air transportation.

Report on Standardization

J. C. Irwin, Chairman*

Following introductory remarks on the work of the association in standardization work, the true meaning of standardization and the responsibility of the individual committees of the association in keeping their own recommended practices up to date and in collaborating with other bodies and organizations, the committee reported on its meeting with representatives of the National Bureau of Standards and the Federal Specifications Board on May 22, 1931.

Under the head of simplified practice the committee called attention to the fact that there are special opportunities for

* Valuation Engineer, Boston & Albany

economies in the railway field by attention to simplified practice or "Simplification," bringing about the elimination of unnecessary or uneconomical types, sizes and grades of materials. It said that much progress has been made by individual railways in analyzing their stores stocks and in eliminating unnecessary varieties, but that there is still a very large field for co-operation between the railways and industry in the study of supplies with the view to simplification and standardization.

Calling attention to the work of the National Bureau of Standards, the committee pointed out the accomplishments which have been made in the simplification and standardization of a large number of commodities, citing as examples such commodities as vitrified paving brick which has been reduced from 66 varieties to 6, metal lath which has seen 78 varieties reduced to 4, and woven wire fencing, of which there are now only 62 varities whereas formerly there were 552.

Under the head of the American Standards Association, the report dealt with A.R.A. representation; the withdrawal of sponsorship by the A.R.E.A. of the two American Standards Association projects, specifications for steel railway bridges and specifications for movable railway bridges, which was effected on September 10, 1931; other subjects for standardization; and the Electrical Standards Committee.

Following information concerning railway personnel of the Canadian Engineering Standards Association, the report continued in Appendix A, which was a monograph on Simplification in the Railway Field, by Edwin W. Ely, chief, Division of Simplified Practice, Bureau of Standards, Department of Commerce, and Appendix B, which consisted of a list of standards approved by the American Standards Association between September 1, 1930, and September 1, 1931.

Shops and Locomotive Terminals

L. P. Kimball, Chairman*

The committee gave detailed consideration to the seven subjects stated in the following appendices, and, furthermore, reported progress on the subjects of welding equipment installations as applied to shops and locomotive terminals, and firing-up stations for locomotives.

It recommended that the reports in appendices B, C, D and E be accepted as information, and that the conclusions of the reports in appendices A, F and G be accepted for inclusion in the Manual.

Appendix A—Revision of Manual

The committee recommended six revisions in the Manual under the general head of enginehouse design, and three revisions under the general head of store houses for shops and locomotive terminals. Under the first head its suggested changes had to do with the subject matter under Turntable, Smoke Jacks, Engine Pits, Windows, Mechanical Handling Devices and Floors. Under the second general head the changes had to do with Arrangement, Casting Storage and Construction.

Action.—F. E. Morrow (C. & W. I.), the subcommittee chairman, submitted the revisions proposed and his motion that they be adopted was carried.

Appendix B—Layout and Design of Locomotive Shops

The committee reported that it still feels that it is not justified in establishing rules with regard to the type or size of shop to be recommended as established practice. It pointed out, however, that there are certain fundamentals in shop design, regardless of the type of shop selected, and laid emphasis on one of these which it considered of prime importance, that of the preparation of a time-study to determine the machine tool equipment necessary, the area of shop floor space to be allotted to each department, and the estimated number of men required to operate the shop. The main part of the report proper consisted of such a time-study prepared in connection with the construction of the new locomotive shop of the C. & O. at Huntington, W. Va.

The report also included five exhibits based on the Huntington shop, covering the time-study of machine tool operations, estimated size of forces, arrangement of bays, a yard plan and an airplane view.

Appendix C—Adapting Car Shops for Handling Multiple-Unit Electric Cars

In a brief report the committee stated that from information developed, it appears that passenger car shops lend themselves to those changes necessary to handle the repair and maintenance of multiple-unit cars as well as of automotive rail cars. Particular attention was called, however, to the fire hazards at many existing old shops due to the type of construction employed.

Appendix D—Adapting Enginehouses and Locomotive Shops for the Repair of Electric Power

Following a general discussion of this subject, based on information furnished by eight roads, the committee reported that it would appear that no set rule can be laid down for this problem, and that each situation should be studied separately and decided on its merits.

Appendix E—Confining the Use of Steam Power Plants at Engine Terminal to Heating

The committee presented a detailed study of the possibilites and advantages of eliminating the use of steam power plants at engine terminals for other than heating purposes, through the provision of special equipment now available. All of the major uses for steam were analyzed and consideration was given to possible substitutes. Suggestions on how to estimate the savings possible through confining the use of a terminal power plant to heating, were also given.

Appendix F—Design of Inspection Pits

In a brief report, the committee recommended that the following be adopted for inclusion in the Manual:

Inspection pits should be three to four feet deep, measured from base of rail; of a length not less than the longest locomotive to be inspected; and provided with ample drainage.

Convenient access should be provided by stairway. (In some instances, direct access has been provided from the inspector's office by tunnel.)

Fixtures for general lighting and service outlets for extension cords should be provided for making detail inspections.

A telephone should be provided for communication with the enginehouse, and may be supplemented by the installation of a pneumatic tube system for sending reports to the enginehouse.

Action.—The report was presented by Subcommittee Chairman H. C. Lorenz (C.C.C. & St.L.), who moved its adoption for inclusion in the Manual. The motion was carried.

Appendix G—Engine Terminal Layouts

After reviewing its past work of this subject, the committee pointed out that while there have been no marked developments in steam engine terminal layout design since its report in 1926, marked changes have taken place in engine terminal requirements, brought about largely by the lengthening of engine runs. Based on present conditions and past studies, the committee offered a considerable number of conclusions, which it recommended for inclusion in the Manual. These conclusions, which are too lengthy to restate here, were presented under the following heads: General, site, track layout, water facilities, office and service buildings, lighting, telephones, fire protection, other facilities, and layouts for the use of electric locomotives.

Action.—The report was presented by J. M. Metcalf (M.-K.-T.), subcommittee chairman, who read the conclusions of the committee by title, and his motion that they be adopted for inclusion in the Manual was carried.

Report on Rules and Organization

E. H. Barnhart, Chairman*

The committee reported in some detail on the subjects of the following appendices in addition to reporting progress on an assignment concerning the maintenance of telegraph and telephone lines and appurtenances. It recommended a number of changes in the Manual, appendices A and B; that the rules offered in Appendix C and the titles in Appendix F be approved for publication in the Manual; and that the subject matter presented in appendices D, E, G, and H be received as information.

Appendix A—Revision of Manual

The committee on Economics of Railway Location reported in Bulletin 331, Pages 232-234, information on the proper size and character of field organizations for railway location and construction, and recommended its approval for printing in the Manual. There being material already in the 1929 Manual bearing on this same subject, this committee with-

* Engineer of Buildings, Baltimore & Ohio

* Industrial Engineer, Baltimore & Ohio

drew its recommendations and the Committee on Rules and Organization was instructed to collaborate with the Committee on Economics of Railway Location so that the additional material might be harmonized with that already in the Manual. This the committee did, including in its report the changes in the Manual necessary to reconcile the differences between that already in the Manual and the recommendations of the Committee on Economics of Railway Location.

Action.—P. D. Coons (C. B. & Q.), chairman of the subcommittee, presented the report and the changes proposed were adopted.

Appendix B—Revision of Manual

In order to harmonize the wording of the definitions of typical positions under "Organization," Pages 809-810 of the 1929 Manual, with the wording of definitions of other typical positions offered in Appendix F of this report, the committee revised these definitions slightly. The definitions include those for division engineer, supervisor of bridges and buildings, supervisor of water service, supervisor of signals, supervisor of telegraph and telephone, supervisor of track and supervisor of work equipment.

Action.—The report was presented by P. D. Coons (C. B. & Q.), chairman of the subcommittee, and the changes offered were adopted.

Appendix C—Rules for the Maintenance of Bridges—Steel Structures

The committee offered for adoption the following rules for the maintenance of bridges—steel structures, which were reported as having the approval of the Committee on Iron and Steel Structures:

1100—Nuts on floorbeam hangers must be brought to a bearing; expansion bearings of all metal bridges must be kept clean, properly lubricated and free to expand or contract; rivets attaching stringers to floorbeams and beams to posts must be kept tight.

1101—When adjustable lateral or center rods are found to be loose or damaged, prompt report must be made to the supervisor of bridges and buildings.

1102—Rigging, staging and scaffolding must be substantially placed and it must be known that same is safe before permitting its use. When within standard clearance, flag protections must be provided in accordance with the rules, and the superintendent notified.

1103—Space between steel and backwalls must be kept clean.

1104—Worn or distorted base or cap plates should be reinforced or replaced.

1105—Anchor bolts must be kept in place and nuts tight.

1106—Cracked or broken castings must be replaced.

1107—Lattice bars or batten plates that are broken, bent or that have a reduced section, must be replaced.

1108—Flanges that are broken, worn or distorted must be replaced.

1109—Alinement of compression members must be checked and, if found to be out of line, reported to the supervisor of bridges and buildings.

1110—Rivets having broken heads or rivets that are loose must be replaced.

1111—The ballast must be kept away from the steel on ballast deck bridges. Where there is a concrete floor, a waterproof joint must be maintained between the concrete and the girder web.

1112—On open deck bridges proper clearance must be maintained between base of rail and top of floorbeams.

Action.—Subcommittee Chairman A. B. Griggs (A.T. & S.F.) presented the report, which was adopted for printing in the Manual.

Appendix D—Rules for the Maintenance of Bridges—Masonry

Under this head, after collaboration with the committees on Wooden Bridges and Trestles, Masonry and Iron and Steel Structures, the committee offered as information seven rules for the maintenance of masonry bridges and composite structures. It reported that it had not had an opportunity to secure the approval of the collaborating committees as yet, but planned do so during the ensuing year.

Action.—Following the presentation of the report by A. B. Griggs (A.T. & S.F.), subcommittee chairman, M. Hirschthal (D. L. & W.) objected to the fact that no mention was made of the necessity for giving proper attention to principles of design when repairing masonry bridge structures. W. P. Wiltsee (N. & W.) suggested that the manner of dealing with expansion joints should also be given consideration in this report. Mr. Griggs explained that the committee contemplated further work on the subject of the rules and that it would be glad to take these suggestions under consideration.

Appendix E—Rules for the Maintenance of Other Terminal Structures

The committee presented the following new rules covering turntables and oil houses:

Turntables—

(1) Turntables must be given close inspection at regular intervals.

(2) Careful maintenance must be given at all times by each department assigned to the various units. The center pier must be kept level, firm and unyielding.

(3) Circle rails must be kept in correct surface and alinement.

(4) Track rails must be in good surface, anchored against end movement and properly supported at the ends of the tables.

Oil Houses—

(1) Repairs must not be made with open flame lights, and in no case until investigation has been made to determine that oil or gas fumes do not exist.

Appendix F—Titles to Designate Positions of Corresponding Rank in Maintenance of Way Service

The committee this year offered the following definitions for assistant division engineer and assistant engineer, maintenance, which it recommended be approved and published in the Manual:

(1) Assistant Division Engineer—Engineer who reports to the division engineer, supervises general maintenance work and acts for the division engineer in his absence.

(2) Assistant Engineer, Maintenance—Engineer who reports to the division engineer, is responsible for the preparation of plans and estimates and supervises field and office engineering work.

The committee also offered for adoption definitions for the different classes of foremen in the maintenance of way department.

Action.—Richard Brooke (C. & O.), chairman of the subcommittee, presented the report, which was adopted for inclusion in the Manual.

Appendix G—Positions Below the Rank of Foreman—Maintenance of Way Department

Under this assignment, the committee sent out a questionnaire, from the answers to which it prepared and presented a select list of titles for positions in the maintenance of way department below the rank of foreman. It reported that it is not yet ready to suggest a proper title for the position of assistant engineer in departments other than the maintenance of way department.

Appendix H—Rules for Fire Prevention in the Maintenance of Way Department

The committee offered a number of rules for fire prevention as applying to the maintenance of way department, these rules being stated in the form of duties and responsibilities of the several division supervisory officers. In preparing the rules, the committee collaborated with the Railway Fire Protection Association, which association gave its tentative approval of the rules.

Action.—The report was presented by Subcommittee Chairman W. C. Mack. Exception to the report was taken by W. A. Radspinner (C. & O.) because no mention was made of the responsibility of employees of lower rank in preventing fires. He remarked also that the prompt reporting of fires and their thorough investigation should be required and that in placing responsibility for fire protection distinction should be drawn between buildings and equipment. Mr. Mack stated that these suggestions would be given consideration by the subcommittee in the course of further study of the subject.

Report on Grade Crossings

J. G. Brennan, Chairman*

The report of the committee this year covered seven subjects, four of which were reported on in some detail as indicated in the following appendices. Progress was reported on the subjects of the economic aspects of grade crossing protection in lieu of grade separation; laws, regulations and practices governing dimensions and clearances affecting construction,

* Engineer of Grade Crossings, New York Central

protection, elimination and separation of grades of highway crossings; and law and practices for determining the division of cost of grade separation projects.

Appendix A—Revision of Manual

The committee, under this head, reported on five subjects. On Subject (a) The illumination of highway crossbuck signs by means of reflecting buttons, it reported progress. Under Subject (b) The proper location of whistling post, it offered the following recommendation as information:

The committee recommends that the present practice of locating whistle posts ¼ mile from the grade crossing be continued. In special cases, where local conditions require, the distance of the whistle post from the crossing may be varied, if not in conflict with law.

Under Subject (c) The proper lighting of the base of signals located in the center of the highway, it offered as information the following conclusion:

The committee is of the opinion that the proper lighting of the base of signals located in center of the highway is taken care of adequately by present A.R.E.A. standards.

In the case of Subject (d), on the illumination of advance warning signs, the committee recommended that the present standard advance warning sign, as shown in Fig. 6, page 664 of the Manual, 1929, be revised to provide that the letters "R R" and the Cross "(×)" be illuminated by means of reflecting buttons in accordance with a sketch which it submitted as Exhibit A.

The committee also recommended changing from "may" to "should," the first word of the second line in Item 4, under Highway Crossing Signs and Signals, Page 64, Bulletin 337, additions to the Manual.

Action.—The matter was submitted and a motion to approve the committee's recommendations with respect thereto was carried after brief discussion.

Appendix B—Merits of Various Types of Grade Crossing Protection

This report, which was presented as information, consisted of brief descriptive statements concerning five types of grade crossing protection, the statements having been based on claims of the manufacturers.

Appendix D—Forms for Classifying Highway Crossings and Recording Traffic

The committee presented a form for recording data on highway grade crossings, and also two forms for recording traffic and delays at grade crossings (one a recorder's sheet and the other a summary sheet). It recommended that all three forms be printed in the Manual. It also recommended that the summary form, previously printed in the proceedings for 1931, Page 87, be omitted, but that reference be made to it as information.

Action.—Strenuous objections was raised to the form which was offered for adoption for inclusion in the Manual, by R. H. Ford (C.R.I. & P.), who contended that the compiling of all the information demanded by this form for all the highway crossings on any railway would entail an enormous expenditure. He also objected to it on the ground that it was predicated on the idea of eventual separation of grades rather than with the thought of its elimination by the closing of the highway. Chairman Brennan defended the form on the ground that the information it called for was of utmost necessity in presenting the railways' side of the case in a grade separation hearing. He was supported in his stand by A. H. Rudd (Penna.), W. P. Wiltsee (N. & W.) and J. C. Irwin (B. & A.), the latter suggesting that Mr. Ford's objection could be removed by eliminating a sentence in the preamble, requiring that reports be made out in accordance with this form for all crossings. This change was accepted by the committee, as was also the change suggested by G. J. Ray (D.L. & W.), that the heading be changed to eliminate reference to the classification of highway crossings, after which the motion to adopt the form for inclusion in the Manual was carried.

Appendix E—Order in Which Protection, Elimination and Grade Separation Should Be Considered

In a report submitted as information, the committee confined itself largely to an analysis of the requirements of its assignment and the factors that are involved. It also presented as part of its report, an article by John P. Hallihan, chief engineer, Rapid Transit Commission, Detroit, Mich., on "The Advantage of Group Participation of Railways in Consideration of Grade Separation Problems in Cities," which the committee said indicates that practical results can be obtained when the subject is approached in the proper manner.

Report on Maintenance of Way Work Equipment

C. R. Knowles, Chairman*

As a result of its work during the year, the committee presented reports on six subjects, reference to which is made in the appendices which follow. It also reported progress on the subjects: Definition of terms and preparation of material for the Manual; types of snow-melting devices as an aid in facilitating train operation and reducing maintenance costs; methods of keeping data on work equipment and labor-saving devices; selection and training of maintainers and operators of work equipment; organization for the use and maintenance of air and electric tie-tamping machines; use of weed mowing equipment, including horse-drawn and power mowers, operating both on and off the track; and manual of instructions for the care and operation of maintenance of way work equipment.

Appendix A—Standardization of Parts and Accessories for Railway Motor Cars

During the year the committee continued its study, and as a result it offered for adoption a series of recommendations covering frame bolts, gasoline lines, windshields, rail skids and extension lifting handles. The study made by the committee included the practices on a number of railways, as well as the recommendations of motor car manufacturers. The committee also reported progress on the design of gas tanks, brake shoes and ignition systems, and offered as information, drawings showing gasoline line connections, a typical design for windshields, and two typical designs for coupler drawbars.

Action.—In the absence of Subcommittee Chairman G. R. Westcott (M.P.), the report was presented by Mr. Knowles, and four of the specifications for recommended practice were approved for publication in the Manual, but Specification No. 2—Gasoline Line Connections—was referred back to the committee for further study.

Appendix B—Air and Electric Driven Tools in Maintenance of Way Work

Following are some of the comments included in the early part of the committee's report, which was submitted as information:

The adaptability of air and electric driven tools to railway maintenance of way work depends on the class of work and source of power. The portable air compressor with flange wheels is easily removed from the track and has proved efficient in track and bridge work. Small tools operated by electric power are of rather recent origin. Since the introduction of the portable generator, the number of electric driven tools has increased and made possible their use in bridge and building work at locations where power lines have not been constructed. The use of air and electric tools should assist in producing results that will help the present forces of the railways to make up for reduced man power.

From the returns to a questionnaire, the committee prepared and submitted lists of the applications of compressed air and electricity, involving the use of small tools, in railway maintenance, and also two tables, one showing the actual use of pneumatic tools and compressed air and the other the actual use of electric tools and facilities on a number of roads.

In conclusion, the committee reported that compressed air and electric tools have proved economical and efficient in many railroad operations and that there are possibilities for further development.

Appendix C—Dragline Equipment With Caterpillar Traction in Maintenance of Way Work

Following a general description of dragline equipment mounted on caterpillar tractors, the report included a statement of the many classes of work on the railways for which this equipment is adapted. Among the classes of work mentioned were grading, ditching, widening banks, widening cuts, cleaning under bridges, cleaning drift, cleaning out reservoirs, loading and unloading cinders, gravel, etc., and, when equipped with a derrick or with a magnet or leads, unloading or loading rail, handling timbers and structural steel, driving piles, etc.

*Superintendent Water Service, Illinois Central

Responses to questionnaires sent out by the committee indicated, among many other things that while few roads are using draglines in maintenance of way work, every road using them endorses them very highly and in most cases has extended their use; furthermore, that the most popular type of machine is operated by gasoline motor.

After giving certain suggestions as an aid in the selection of a dragline, the committee offered the following conclusion as a result of its study:

Dragline machines mounted on caterpillar treads, with interchangeable equipment, are useful and economical. Their uses are so varied that most roads will have sufficient necessity for them to justify their purchase.

It was recommended that the report be received as information and the subject dropped.

Appendix D—Paint Spraying Equipment and Typical Work Organizations

Beginning with the first uses made of paint spraying machines, the committee traced the subsequent development of this equipment to the present time, giving a detailed description of the various types now in use. It then continued with a comparison of spray and brush painting and an analysis of painting organizations. A few of the more pertinent statements of the report, particularly with regard to the adaptability and quality of spray painting, are given in the following:

Paint spraying equipment is available for practically every class of work. The consensus of opinion seems to be that the relative cost of applying the paint is the governing factor, as there seems to be little difference in the durability of paint applied by spray and by brush. The decision as to whether spray or brush painting is cheaper depends largely upon the amount of work and the nature and size of the jobs. It seems to be the general consensus of opinion that spray painting is at least equal, if not superior, to brush painting in respect to appearance and durability.

The chief advantage in the use of spraying equipment over brush painting is the great savings in time and labor. Estimates of this saving run from 10 per cent to over 50 per cent of the cost of hand brush painting on the same work, depending on conditions, with the average about 35 per cent.

The report of the committee was submitted as information with the recommendation that the subject be discontinued.

Appendix E—The Use and Maintenance of Ballast Cleaning Machines

Following a brief history of track construction and the problem of keeping ballast clean, the report of the committee which was offered as information, described in order of development the more important ballast cleaning machines and equipment which have been used with success, giving in each case the cost of cleaning per lineal foot of track. The more important units of equipment described include the ditcher with clamshell bucket and screens, the Mole, a large special machine built for one of the eastern roads, with two clamshell buckets operating from its side, and a relatively new machine which cleaned approximately 200 miles of center ditch on an eastern road during 1931. Reference was also made in the report to discers, plows, scarifiers and the border mole.

It was recommended that the subject be discontinued.

Action.—The report was presented by Subcommittee Chairman William Elmer (Penna.). Upon motions by V. R. Walling (C. & W.I.) and J. V. Neubert (N.Y.C.) this subject and the report on Spray Painting (Appendix D) were referred back to the committee for further consideration.

Appendix F—Spraying Machines for Oiling Rails and Fastenings, Steel Structures and Roadbed

The report of the committee first pointed out the factors causing rust of the track structure and then discussed briefly rust prevention by oil application. Abstracts from the report, which was presented as information, are given in the following:

For effective results rust preventatives must be applied to track-steel while in its place in the track structure and should be properly applied annually. Authorities recognize asphalt base oil containing approximately 50 to 60 per cent asphaltum as the most effective and most economical for protective coatings to prevent rust.

The most practical and economical method of application of oil to track-steel as a rust preventative is the pressure-spray method. There are several railway track oilers available for use, self-propelled and non-self-propelled. Twelve roads now use oil-spraying equipment.

The report also contained two tables which summarize the answers received to a questionnaire sent out by the committee and show for the roads listed their practice, gallons of oil used and approximate costs.

Action.—In the absence of Subcommittee Chairman Fred Zavatkay (N.Y.,N.H. & H.) the report was presented by Mr. Knowles. The subject was referred back to the committee for further consideration.

Report on Rivers and Harbors

E. A. Hadley, Chairman*

The report of the committee on the different subjects which it considered is outlined in the following appendices. In addition to those subjects mentioned, the committee also gave consideration to the subject of harbor structures, on which it reported progress.

It recommended that the specifications submitted last year covering loose fascine type mattresses, board mattress, mud cells, riprap bank paving and anchor piling, be approved for publication in the Manual; that the specifications for the several types of river bank protection in Appendix B be received as information and for further study; and that the matter in appendices A, C, D and D-6 be received as information and the subjects continued.

Appendix A—Definitions of Terms

Continuing the study of this subject from last year, when a large number of definitions of terms were submitted, the committee revised many of its definitions and added a number of new ones. The report this year contained 115 definitions which the committee said it would study further before recommending that any of them be included in the Manual.

Appendix B—Levees, Dikes and Mattresses

In this appendix the committee reported on two subjects; suitable types of construction for levees, dikes and mattresses for use under varying service conditions, and specifications for the construction of the several types of river bank protection in common use. The report on these subjects supplements and amplifies the reports on the same subjects submitted in 1930 and 1931, presenting additional information concerning different types of flood control and bank protection. Under the second subject mentioned, specifications for the construction of the several types of river bank protection in common use, the committee presented additions to the specifications for levee construction appearing in Bulletin 324, and new specifications covering woven willow mattresses; pole and brush bank mattresses; pole, brush and rock dikes; and brush fascines.

Action.—In the absence of Subcommittee Chairman A. F. Blaess (I.C.), the report was presented by Mr. Hadley. The specifications for river bank protection submitted in 1931 were approved for inclusion in the Manual.

Appendix C—Types of Bulkheads, Jetties and Seawalls

In Appendix C the committee gave consideration to two subjects. Under the first, the report described the different types of bulkheads, jetties and seawalls, including details concerning their purpose, comparison of first cost, service life and maintenance cost. It also included sectional drawings of bulkhead and seawall construction.

Under the second subject considered, the report described different types of fender systems for protecting wharves, including uses for each type, comparison of first costs, service life, maintenance costs and a number of drawings.

Appendix D—Warehouse Piers, Coal and Ore Piers, Car Float and Other Piers

A large part of the committee's report on this subject dealt with docks of the types built to meet ordinary conditions, where the change in water surface due to the rise and fall of the tides is less than 15 ft., which do not require closed docks with gates. Local conditions, such as channels, tidal currents and the arrangement of slips for ease of approach were not considered in the report. An idea of the scope of the report on docks is seen from the fact that it was discussed under the following heads: Pile repairs, concrete poured around piles, creosoted piling, pre-cast concrete cylinders and jackets, concrete cylinders protecting pile clusters, reinforced concrete

* Chief Engineer, Missouri Pacific

piles, concrete docks, comparative costs and advantages of different types. The report also discussed warehouse and coal and ore piers.

Appendix D-6—Size and Depth of Slips

Under this head the committee recommended the size and depth of slips required for the economical operation of a number of types of wharves, under various traffic conditions. The committee reported that considerable information had been secured on the subject of harbor structures, but that it was not in suitable form as yet to be submitted to the association.

Report of Committee on Roadway

C. W. Baldridge, Chairman*

The committee considered 12 subjects during the year and reported at some length on 9 as pointed out in the following appendices. It reported progress on the subjects of drainage areas, water runoffs, and the proper size of waterway openings; methods of correcting soft spots in railway roadbed, where it is impracticable to stabilize by drainage; and specifications for galvanizing metal pipe culverts.

Appendix A—Revision of Manual

Collaborating with the Railway Bureau of the Portland Cement Association, the committee drew up a revised set of specifications for concrete fence posts which it recommended be substituted for specifications for this product in the 1929 Manual. The new specifications are much shorter than the existing specifications, since many items have been eliminated through reference to the A.R.E.A. specifications for concrete.

Action.—Following the presentation of this matter by A. E. Botts (C. & O.), subcommittee chairman, M. Hirschthal (D. L. & W.) objected to the paragraph on curing because it specified a curing period of two days at a temperature of 120 deg. F. He stated that this was inconsistent with good practice if no provision was made for taking care of the evaporation at this temperature. A. C. Irwin (Portland Cement Assn.) contended, however, that this matter was amply covered in the same paragraph of the specification. This material, with certain revisions in the paragraphs on "curing" and "tests," was adopted for inclusion in the Manual.

Appendix B—Roadbed Drainage

Feeling that the subject of roadbed drainage was not adequately covered in the Manual the committee gave extended attention to this subject in last year's report, and, after continued study since the last convention, it prepared a report on sub-surface drainage which it submitted for adoption and inclusion in the Manual to replace the matter already in the Manual on "Pipe Drains." The new material is quite detailed in character and covers the following main points: Definition, soil moisture, soils, field test for soils, necessity for drainage, water cut-off, drainage of open soils, drainage of impervious soils, and drain pipes.

Action.—G. S. Fanning (Erie), subcommittee chairman, presented this report. J. L. Pickles (C.N.R.) inquired if the committee had given consideration to the use of cedar wood box drains, and Mr. Fanning replied that they had not. He then read a written note of criticism from J. S. Huntoon (M. C.), in which Mr. Huntoon objected to the manner in which the paragraph specifying the kind of pipe to be used was phrased and also to the use of cinder ballast for backfilling. The report was adopted for publication in the Manual.

Appendix C—Influences Affecting Fence Wire and Methods for Prolonging Its Life

Following a brief report on certain barbed wire fence installations, the committee offered the following conclusions as information:

The committee is of the opinion that the service life of galvanized wire in fences, manufactured and erected in accordance with A.R.E.A. specifications, will average 15 years, but where exposed to the action of sea water or fumes from industrial plants, service life will average from 6 to 10 years.

From records available and from information obtained through a report set forth in Farmers Bulletin 239 dealing with "The Corrosion of Fence Wire," published following an investigation made by the U. S. Department of Agriculture a number of years ago, the committee is of the opinion that the use of corrosion resisting metal for the base in fence wire will materially increase the service life of such wire.

* Assistant Engineer, A. T. & S. F.—Chicago

Appendix D—Permanent Roadbed Construction

The committee continued the study of the subject in question but reported that other than observations of user roads on the functioning and maintenance cost data of their respective installations, and the securing of a description of the Lehigh Valley's Musconetcong Mountain tunnel section, which was submitted in its report, together with a sectional view, it had failed to develop any data of value to add to the reports previously appearing in the association's proceedings.

With regard to the first installation of concrete track on the Pere Marquette, which has been in service for nearly five years, the committee reported as follows:

The roadbed itself shows no change in condition since the report of a year ago. It has been found, however, that the amount of rail batter is more noticeable than on ordinary track, due to the rigid support, from which the rail is separated by only a ⅛-in. layer of pressed wood fibre. Enough batter had developed on certain joints to make it desirable that riding quality be improved, and in April, 1931, 40 joints out of a total of 68 were built up by the oxy-acetylene process.

The committee reported that the newer installation on the Pere Marquette, placed in operation on September 20, 1929, remains in the same condition as when built, except that slight surface spalling has occurred at three joints, one more than recorded last year. No cracks have appeared, no appreciable settlement has taken place and no abnormal batter is apparent so far.

Appendix E—Overhaul in Grading Contracts and Methods for Calculating Overhaul

In a revision of the 1925 Manual, made in 1926, an optional overhaul clause, contained in the specifications for the formation of the roadway, was, by vote of the committee, eliminated. Later a canvass of a considerable number of the roads indicated that sufficient use is made of overhaul clauses in grading contracts to make it advisable to submit again a specification for overhaul and a method for the calculation of overhaul. This the committee did, submitting specifications for overhaul and a detailed method of computing it, both of which it recommended be adopted for inclusion in the Manual.

Action.—Because of newly-acquired knowledge on this subject, Mr. Baldridge, who also acted as chairman of this subcommittee, stated that the committee wished to withdraw its recommendation that this report be accepted for inclusion in the Manual. The subject, therefore, was reassigned to the committee for further study.

Appendix F—Use of Highway Crossing Planks and Substitutes Therefor

The activities of the committee during the year were confined to the collection of additional installation and maintenance cost data on crossings of different types, as well as the accumulation of data covering life studies of different types of crossings. Considerable cost data were presented in the report, which was submitted as information, but the committee stated that until more information is available, the relative merits of plank and substitutes therefor cannot be determined.

Appendix G—Means of Protecting Roadbed and Bridges From Washouts and Floods

To avoid conflicting with the work of the Committee on Rivers and Harbors, the committee confined its study to streams which are not classed as navigable and to conditions which may cause the flooding of railway tracks. In its report this year, which it recommended for inclusion in the Manual to replace items 1 to 5, inclusive, under "Washout" Page 40, the committee presented an outline of the work which it plans to undertake and then a detailed discussion of the subjects in line with the outline, which covered mainly the permanent protection of bridges and fills and the temporary protection of bridges, culverts and fills.

Action.—Subcommittee Chairman H. M. Swope (A. T. & S. F.) presented the report, which was adopted for publication in the Manual.

Appendix H—Heaving Track

In its report, which was offered for adoption and inclusion in the Manual, the committee presented a terse discussion of the subject in question under the main headings of cause, prevention and maintenance methods. Among other items under the head of prevention, it pointed out the importance of providing good surface and sub-surface drainage during construction, the necessity for a proper depth of suitable ballast, and

that drainage and clean ballast in existing tracks are the greatest factors in preventing heaving.

Action.—In the absence of C. S. Robinson (Me. Cent.), chairman of the subcommittee, Mr. Baldridge presented the report. Acting on the objection of J. L. Pickles (C.N.R.) to the use of cinders for backfilling after the subgrade has been excavated to correct heaving, the committee agreed to substitute the term "porous material" for "cinders" in that part of the report which referred to this matter. With this revision, the report was accepted for inclusion in the Manual.

Appendix I—Specifications for Pipe Line Crossings Under Railway Tracks

The committee presented for adoption specifications for pipe line crossings under railway tracks, these dealing with lines conveying oil, gas, gasoline and other inflammable substances as well as steam or liquid under pressure. For all of these substances the specifications call for encasing the carrier pipe in a larger pipe and prescribe its location.

Action.—Because of certain objections that have been proposed in regard to certain material in this report, P. T. Simons (M.P.),* chairman of the subcommittee, who presented the report, stated that the committee wished to continue its study of this subject for another year. The subject, therefore, was reassigned to the committee for further study.

Report on Stresses in Track

Arthur N. Talbot, Chairman*

The special committee handling this subject presented a progress report in which it was said that, co-operating with a similar committee of the American Society of Civil Engineers and with the American Railway Association, it had continued its investigations during the year in the field, laboratory and office. The main part of the short report of the committee consisted of an outline of a test which was made on the Chesapeake & Ohio near Ashland, Ky., and a more or less similar test which was made on a section of Geo track on the Missouri Pacific near Middlebrook, Mo.

The committee called attention to the paper on "Rail Stresses and Locomotive Tracking Characteristics Found in Tests on the Great Northern Railway" by J. Paul Shamberger and B. F. Langer, engineers of the Westinghouse Electric and Manufacturing Company, published in Bulletin No. 339 of the association. It pointed out that this report was a valuable contribution with regard to several aspects of the interrelation between locomotive and track on tangent and curved track, with particular reference to variations in the vertical and horizontal loads exerted by individual wheels on the rails of curved track, as found with several types of locomotives.

Action.—This report was presented only by title, the time allotted to this committee being devoted to an illustrated lecture by Dr. Talbot. The first portion of this related to a consideration of the behavior of the rail joint under load and was demonstrated by a chart showing that stresses due to bending of the joint bars attain a relatively high peak at the joint between the rails. This is due to the concentration on the bars of the large bearing forces from the rails close to their ends, but which are less intensified with a poorer fit of the bars. Dr. Talbot also discussed the design of bars, demonstrating the difficulty of obtaining adequate strength and stiffness in bars for rails in patterns weighing less than 100 lb. per yard. The most favorable condition is obtained in tall rails possessing a relatively great distance between fishing surfaces.

He showed that a decrease in the tie spacing adjacent to the joints results in a reduction in the bending stresses in the joint bars, but that this practice introduces complications such as the effect of the closer spacing under the opposite rail. The lengths of the bars and the consideration of whether the joints are "supported" or "suspended" do not enter into this problem.

The second part of the lecture related to what Dr. Talbot called the variability of track. Diagrams showing variations of as much as 100 per cent in the rail stresses above and below the mean, from point to point along the rail in relatively short sections of track, was accounted for by corresponding variations in the supporting power of different ties. This was demonstrated by charts showing the play between the bases of the rails and the tie beds in the ballast. As a result of this variation, there are differences of as much as 95 per cent below to 160 per cent above the mean in the load carried by individual ties in a single panel.

Another influence responsible for variations in rail stress is lack of uniform bearing of tie plates on the ties which, in Dr. Talbot's opinion, can be corrected by mechanical adzing of the ties, or perhaps if practicable, the application of the tie plates in a shop. He also suggested the opportunity for obtaining better track through the development of a device for the testing of the effectiveness of tamping.

Economics of Railway Operation

J. E. Teal, Chairman*

The committee made report on four subjects as indicated in the appendices below, and reported progress on the subjects of the most economical makeup of track to carry various traffic densities, and methods for determining the most economical train length, considering all factors entering into transportation costs.

It recommended that appendices A, C and E, as well as Part 2 of Appendix B, be received as information and the subjects continued, and that Part 1, Appendix B be adopted for publication in the Manual.

Appendix A—Revision of Manual

The committee reported that it is of the opinion that since the material under the heading "Method for the determination of proper allowances for Maintenance of Way Expenses due to increased use and increased investment" was adopted and printed in the 1929 Manual, changed conditions covering maintenance practices may or may not have affected the use of factors relating to a number of the accounts mentioned. This question has been taken up with the various committees that may be affected and the committee expressed the hope that conclusions will be reached in order to enable it to offer recommendations next year.

Appendix B—Methods for Obtaining More Intensive Use of Existing Railway Facilities

In Part 1 of its report, the committee said:

Studies have been undertaken and published in the proceedings to test the theory of train hour diagrams and to obtain experimental knowledge that will serve to extend the scope of the method in connection with the investigation of factors affecting freight train operation. They indicate that comparative freight train performance charts provide a simple and accurate method for showing actual results obtained by various methods of operation or changes in facilities.

From these studies a group of conclusions were drawn, which the committee recommended for adoption and publication in the Manual.

Part 2
Converting Double Track into Single Track

Under this head the committee submitted a complete report of a study made on the East and West railroad on the effect of removing 24.6 miles of track on a 62.5-mile section of road where traffic had been reduced from a total of 30 trains—freight and passenger—per day in 1920, to 12.6 trains—freight and passenger—per day in 1930.

The conclusion of the committee was that where the volume and distribution of traffic on a double-track line has decreased enough to warrant a reduction in facilities, the converting of double track into single track should be considered.

Action.—The conclusions presented in Part 1 were adopted. Part 2 was accepted as information.

Appendix C—Solution of Special Problems Relating to More Economical and Efficient Operation

During the last year the committee gave attention to a preliminary study of the problems of operation as affected by curvature and rise and fall. In a brief report it said, in part, as follows:

In many cases, the necessity for grade reduction or realinement is so obvious that almost any method of analysis will readily show the need of the change, and the results obtained will justify the investment. However, as we approach refinement in grade and curvature problems, necessity and benefit are not always so apparent, and the question of whether the same results can be obtained through other means becomes important. Recent developments in methods of maintaining smoother riding track structure, including the greasing of

* Professor Emeritus, University of Illinois

* Special Engineer, Operation, Chesapeake & Ohio

curves which not only prolongs rail life but reduces resistance to train haulage, are factors which must now be considered.

In view of these new factors, the committee expressed the belief that there is need for further investigation and stated that it is now securing the necessary further data on which its conclusions must be based.

Appendix E—Effect of Traffic Density on Operating Expenses

The committee is satisfied that certain broad and determinable factors underlie the fluctuations in railway operating expenses, which principles have a casual relation to traffic density. Analysis of statistical data applicable to all Class I roads of the United States, adjusted for changes in money values, gives fairly consistent results, indicating that for moderate variations in traffic density, the expense of a road of the average traffic density of Class I roads of the United States and with average capital investment, may be considered to be 35 per cent fixed or independent of traffic, and 65 per cent variable or fluctuating directly with traffic. Attempts to confirm the general conclusion by the analysis of the results of individual roads as reported to the Interstate Commerce Commission failed.

Economics of Railway Labor

F. M. Thomson, Chairman*

During the last year the committee gave consideration to nine subjects, on eight of which it made report as indicated in the following appendices. It recommended that no revisions be made in the Manual; that appendices B, C, F, G, H and I be received as information and the subjects continued, except for the conclusions presented in Appendix C, which it recommended for publication in the Manual; and that appendices D and E be received as information and the subjects discontinued, except for the conclusions offered, which were recommended for inclusion in the Manual.

Appendix B—Analysis of Operations on Roads That Have Greatly Reduced Labor Requirements

The report of the committee was the result of detailed study of maintenance of way methods and practices on the Lehigh Valley, this road having been selected for study because of the outstanding reductions which it has made in the amount of labor expended on the maintenance of its property.

The report included man-hour employment figures, which show that whereas more than eleven million man-hours were employed on the Lehigh Valley in 1918 and in 1920 for current repairs only, the man-hours employed since have been reduced consistently from year to year until there were only 5,590,042 in 1929 and only 4,822,300 in 1930.

As a result of its study, the committee pointed out 23 changes in methods, standards, materials, labor-saving equipment, etc., on the Lehigh Valley, which it found contributed to the greatest extent to the reduction in man-hours employed.

Action.—The material in this report was presented by J. A. Parant (B. & M.), C. J. Ray (D. L. & W.), in discussing that part of the report which referred to the saving in labor expended for tie renewals on the Lehigh Valley, thought that the average tie renewals for the test period of 294 per mile on this road were somewhat high. However, he commended the committee for the excellence and thoroughness of its report.

Appendix C—Effects of Recent Developments in M. of W. Gang Organization

The committee opened its report with a review of its past considerations in connection with this subject, pointing out that some of the most important factors which have contributed toward the realization of economies in railway maintenance and operation include heavier rails, improved joints, better ballast sections, treated ties, the general use of tie plates, and the greater use of such labor-saving equipment as ditchers, spreaders, cranes and hoists of both the locomotive and crawler types, motor trucks and track motor cars, and such devices as tie tampers, ballast cleaners and discers, track mowers and burners, rail laying machines, tie adzing machines, spike drivers and pullers, bolt tighteners and joint beveling machines.

It then discussed the organization of specialized maintenance gangs and gave in some detail the experiences of the Chicago, Milwaukee, St. Paul & Pacific, the Pennsylvania, the Boston & Maine, and the Missouri Pacific (Texas & Louisiana Lines), with this type of gang organization. As a result of its studies, the committee offered the following conclusions, which it recommended for adoption and inclusion in the Manual.

Conclusions

(1) Recent developments in maintenance of way practices, such as the use of improved materials and labor-saving devices, have reduced the amount of track labor required for adequate maintenance.

(2) These developments in maintenance of way practices permit transferring the heavier routine maintenance work from section gangs to specialized gangs equipped with modern labor-saving machinery with large resulting economies.

Action.—The matter in this report was presented by J. F. Dobson (B. & O.) in the absence of F. S. Schwinn (M. P.), chairman of the subcommittee, and the conclusions were adopted for publication in the Manual.

Appendix D—Annual Track Inspections and Prize Awards

The committee found a wide range of opinion and practice as regards the making of annual track inspections and prize awards, and that many roads do not make inspections of this character for various reasons. It pointed out that while the objectives sought by the different roads which hold inspections are generally the same, the manner of conducting the inspections and of arriving at the final results varies between rather wide limits. To illustrate this point, it presented a brief description of the methods of making inspections and awards on 10 roads.

Following a statement of the advantages and disadvantages of track awards, the committee offered the following conclusions, which it recommended for adoption and inclusion in the Manual:

Conclusions

(1) Properly directed competition, stimulated by a material reward for excellence, will increase the interest and activities of the maintenance of way forces.

(2) A well devised plan for an annual inspection, with awards, provides a desirable means whereby a definite spirit of rivalry can be aroused and maintained throughout the working season.

(3) The participants should be assured that the competition is being conducted fairly and that other competitors are not being afforded advantages which are not also available to them. As a means to this end, the mileage should be equated and a standard man-hour allotment per equated mile should be made. This standard should then be modified to correspond with the traffic density over any section or sub-division. The final ratings should then take into consideration any excess or deficiency in the number of man-hours actually employed, as compared with the standard allotment as modified.

(4) The use of track-recording machines to provide comparable records of the variations in line, surface, gage and cross level, is recommended.

(5) The records made by these machines have a high value if made at sufficiently frequent intervals and used for the purpose of directing the work of supervisors and foremen, and of indicating to them the points to which they should give preferred attention.

Action.—In discussing this report, which was presented by Subcommittee Chairman Elmer T. Howson *(Railway Age)*, C. W. Baldridge (A. T. & S. F.) inquired as to why some roads that formerly had made it a practice to make track awards had abandoned this policy. Mr. Howson replied that reasons for this were covered, in part, in the report and he also added that the expense of operating special trains in connection with track inspections and the difficulty of making awards on an absolutely equitable basis had acted as a deterrent in some instances. In his experience, Mr. Baldridge stated, track awards had not proved successful because he had found that after the first year those unsuccessful in winning awards had not exerted themselves with their previous enthusiasm. In answer to this, Mr. Howson referred to the success with which some roads had conducted track inspections for many years. H. C. Crowell (Penna.) wanted to know if any roads were following the recommendations given in Conclusion No. 3 of the report that in order to insure the fairness of track inspections the mileage should be equated and a standard man-hour allotment per equated mile should be made. In reply, Mr. Howson stated that this was not the general practice but that it represented a tendency and that there is an increasing attempt to do it with reasonable accuracy. The conclusions of this report were then adopted for printing in the Manual.

* District Engineer, Missouri-Kansas-Texas—Parsons, Kan.

Appendix E—Relative Economies of Brush and Spray Painting

Following a number of general introductory remarks and reference to work done by the American Railway Bridge and Building Association on this subject, the committee presented in condensed form the replies which it received to a questionnaire with regard to the comparative costs of hand and spray painting. It then presented extracts from periodicals and the replies received to questions with regard to the economical dividing line between hand and spray painting, and the programing of painting work. The remainder of the report consisted of references to published works and articles on the subject of painting, and the following conclusions which it was recommended be approved for inclusion in the Manual:

CONCLUSIONS

(1) That there is a distinct saving in cost and a benefit in better results, greater durability and satisfactory appearance through the use of paint spraying equipment.

(2) That the railways are warranted in extending the use of spraying equipment to small latticework and trim on structures by the use of shields and proper equipment and various types of nozzles for that purpose, and to reduce brush work to a minimum.

(3) The greatest economies can be obtained by using spraying equipment with specialized forces kept on this class of work.

Action.—Subcommittee Chairman G. M. O'Rourke (I. C.) presented the report and its conclusions were adopted for printing in the Manual.

Appendix F—Revised Plans for Outfit Cars

The committee reported that radical improvements have been made by a number of roads in recent years in outfit cars for maintenance of way employees. It indicated that it is revising the plans adopted previously by the association, but said that the work was not far enough advanced to permit the presentation of the plans this year.

Appendix G—Economics of Weed Killing

The committee reported that data had been assembled on methods of weed killing in Europe, as well as in America, but that it was unable to present details this year. It recommended that the subject be continued for further study.

Appendix H—Motor Trucks in Maintenance Work

Following is the brief progress report of the committee:

While the use of trucks in maintenance of way work by the various railways appears to be in its infancy, the results obtained in many instances are favorable. Due to the fact that the data and information for this study were received at a late date, the committee did not feel justified in submitting a final report this year and requested that the subject be continued.

Appendix I—Gang Organization and Methods of Performing M. of W. Work

The committee offered the following progress report:

The committee has given considerable study to the matter now in the Manual and has given special consideration to a revised "Schedule for Renewing Rail Out-of-Face," showing the time distribution for laying 39-ft. and 33-ft. rails. However, all developments are withheld at this time, pending further study.

Report on Ties

W. J. Burton, Chairman*

The following appendices make reference to the five subjects reported on at length by the committee. Progress alone was reported on three other subjects under its consideration. It recommended that the reports contained in appendices A, B, C and D be received as information and that all of its assignments be continued.

Appendix A—Adherence to Standard Tie Specifications

Conditions in the tie trade continued through 1931 as they were in 1930. Thus there were no competitive conditions to provide an excuse for the production or purchase of substandard ties. Observations of stocks of ties by individual members of the committee resulted in the general impression that the reduced number added to railroad stocks maintained the close proximity to standard which was reached during 1929 and 1930. Progress in the adoption of the standard specification for ties was marked by its substitution for the United States Railroad Administration specification on the part of a railroad with more than 14,000 miles of maintained track.

The Committee on Forest Products of the Purchases and Stores division, A.R.A., has recommended that the grouping of the kinds of wood in the standard specifications for ties be reviewed and consideration given to regrouping them according to their market value. The Tie committee is convinced that any grouping of woods on the basis of their market values as ties would be subject to frequent changes and believes that the grouping which is now standard should prevail as more practical than one predicated on prices.

Appendix B—Substitute Ties

Following past practice, the report of the committee this year consisted of a summarized statement of the record of tests of substitute ties being used on a number of roads. Tests on one new type of tie was reported this year for the first time. This tie, installed on the Delaware & Hudson, is of reinforced concrete construction, with oak and yellow pine spiking blocks.

Appendix C—Tie Renewal Averages

As in recent years, the report of the committee this year consisted of two tables, giving the tie renewals for 1930 as reported to the I.C.C., or, in the case of the two principal Canadian roads, as reported to the committee in the same form.

Appendix D—8½-Ft. and 9-Ft. Crossties as Compared with 8-Ft. Ties

Based on 38 replies to a questionnaire, the committee discussed this subject thoroughly and indicated the general consensus of experience of the roads concerned. At the close of its report the committee said:

It is concluded that, although conditions vary greatly, it is possible to determine the saving effected by the use of longer ties in place of 8-ft. ties. An increase in the length of the tie, up to a certain point, increases the effective bearing area, and has a beneficial effect upon the distribution of pressure, which fact should effect savings. The committee is confident that further data can be secured which will permit establishing reasonably correct limits within which the different lengths and sizes of ties may be used most economically.

Appendix E—Methods of Dating Crossties

The report of the committee lists and tabulates information received from 41 roads with regard to the dating of crossties. Essentially, the report shows that over half of the roads reporting use dating nails on all ties, and that only nine of the roads do not use nails or brands of any kind.

Water Service and Sanitation

R. C. Bardwell, Chairman*

The committee presented reports on six subjects, reference to which is made in the appendices which follow. It reported progress on the subjects of the development of deep well pumping equipment; the design and maintenance of track pans for locomotive water supply; the progress being made by Federal and state authorities on regulations pertaining to railway sanitation; and sewage disposal facilities when sanitary facilities are not available.

The committee recommended a number of changes in the Manual, (Appendix A); that appendices B and C be received as information and the subjects continued; and that appendices D, E and F be received as information and the subjects discontinued.

Appendix A—Revision of Manual

The committee presented revised specifications for the standard method of water analysis and interpretation of results, which it recommended be substituted for material in the Manual. It also offered specifications for salt to be used in the regeneration of zeolite water softening plants, which it recommended be approved for inclusion in the Manual.

Action.—The report was presented by Mr. Bardwell. The additions and revisions to the matter now in the Manual

* Assistant to Chief Engineer, Missouri Pacific

* Superintendent Water Supply, Chesapeake & Ohio—Richmond, Va.

recommended by the committee were approved for publication in the Manual.

Appendix B—Cause and Extent of Pitting and Corrosion of Boiler Tubes and Sheets

Since there were no outstanding developments in the theoretical aspects of this problem during the last year and no new methods of merit proposed for inhibiting pitting and corrosion, the committee confined its work to summarizing results of practical service tests of various methods of prevention which have been tried out during the last five years. It reported that information obtained from representative railroads operating in different sections of the country indicates that the most universally used method for preventing pitting and corrosion is that of maintaining sufficient caustic alkalinity in the boiler at all times, a method which is based on the electrolytic theory of corrosion which has been generally accepted as explaining practically all underwater corrosion with the exception of that caused by direct chemical action.

It also pointed out that several very favorable reports on the counter-electric potential method, with the use of arsenic compounds for inhibiting corrosion, were received, and gave the experiences of several roads in protecting boilers and boiler materials from corrosion and deterioration while in storage.

In conclusion the committee stated that the question of corrosion and its prevention must be considered as an economic problem, and, therefore, that the cost of any method of prevention must be compared with the loss due directly or indirectly to deterioration.

Appendix C—Feeding Compounds or Chemicals Into Boilers or Roadside Tanks

The first part of the committee's report dealt largely with material which was presented last year when the committee endeavored to establish the principles and provide the data from which it might be determined in individual cases whether a natural water should be used as locomotive feedwater, (1) without treatment, or (2) with merely the introduction of suitable chemicals into the water in the roadside tank or the engine tank, or (3) whether it should be treated in an independent wayside plant with lime and soda, or whatever chemicals might be necessary to soften and put it into good boiler condition.

Last year the committee called attention to the very important distinction between the possibility and the desirability of operating locomotive boilers with certain kinds of waters with "interior" treatment, and, commenting on this in this year's report, it said in part as follows:

There is no dispute that for small amounts of water not exceeding a hardness of eight grains per gallon, it is usually cheaper and satisfactory to use "interior" treatment, and we call this the zone in which "interior" treatment is desirable.

In the latter part of its report the committee illustrated, and described to some extent, a number of devices and units of equipment in use for supplying compounds or chemicals directly to the water in roadside tanks or directly to the water in locomotive boilers. In conclusion, the committee said:

The most important points to remember in connection with the use of interior boiler treatment are that the results should be subject to frequent chemical examination and that the best means of treating accurately is to regulate the supply by some one of the automatic appliances mentioned.

Appendix D—Effect of Water Conditions on Locomotive Boiler Attention

After discussing this subject principally from the standpoint of the effect of water conditions on the frequency with which washouts, water changes and blow-downs of locomotive boilers must be made, in which the committee gave considerable attention to the subject of foaming, the following conclusions were offered:

Conclusions

(1) A schedule for washouts must be governed by local conditions and particularly the quality of the feedwater. This makes it impractical to outline a program for general application. In districts where all the water is fully treated, 30 days between washouts is usually the practice, with water changes between as found desirable.

(2) Schedules for blowing down likewise vary with the water quality and should be determined for each district from a study of the boiler water concentrations and the field operation.

(3) Water changes are merely exaggerated blow-downs, and their necessity will depend on the blowing schedule while enroute over the district, and the quality of the water.

(4) Here, as elsewhere, the human factor is of first importance. The man at the throttle can make the best of water carry-over with the steam by careful handling. If he has been well-trained, he will carry a reasonable amount of water in the glass, sense the proper time and amount to be blown, and turn the locomotive over to his successor in practically as good condition as when it left the enginehouse.

(5) Adequate supervision and chemical check tests are necessary to accomplish regular and satisfactory results and to secure maximum economies from the regulation of blow-down, water changes and washout schedules.

Action.—The report was presented by Subcommittee Chairman E. M. Grime (N. P.), and the conclusions were approved for inclusion in the Manual.

Appendix E—Coagulants Used in the Treating of Locomotive Boiler Water

Pointing out that the importance of a clarified as well as a properly treated water for the most economical maintenance and operation of motive power is becoming more and more appreciated, the report dealt with the application and comparative economy and effectiveness of various coagulants. Under the heading Savings Effected by the Use of Coagulants, the report read as follows:

Approximately 75 per cent of the railroads answering our questionnaire reported the use of coagulants. The benefits listed included reduction of pipe line stoppage and wear on valves and pumps, as well as eliminating deposits of mud in the boilers. A cleaner boiler water decreases the foaming tendency and permits fewer blow-downs, water changes and washouts. Although information as to savings in terms of dollars and cents is not available, the answers indicated that the additional cost resulting from the use of coagulants is justified.

Appendix F—Standardizing of Valves and Packing for Water Service Pumps

Dealing with the advisability of standardizing valves and packing for water service pumps, the report discussed the replies to a questionnaire which the committee had sent out, indicating the practices of the different roads, and also made reference to a number of specifications on packing and valves set up by the Bureau of Standards.

Closing its report, the committee offered the following conclusions:

Conclusions

(1) Specifications for packing cover many individual types of dissimilar materials and construction, as is indicated by the Federal list of specifications. The packing specification recommended for consideration with the report covers a limited number of the packings most generally used by the railways.

(2) Specifications for rubber pump valves cover a limited field. Such valves may be handled satisfactorily by specifications or by ordering from manufacturers' catalogs. Specifications are not usually required.

(3) The use of a chart for ordering proprietary brands of packing for certain types of pumps is satisfactory. It is parcularly recommended for use where specifications do not exist.

Action.—The report was presented by Subcommittee Chairman J. P. Hanley (I. C.). The chart for listing types of packing for specific types of pumps and the conclusions were approved for inclusion in the Manual.

Report on Buildings

A. L. Sparks, Chairman*

The committee presented reports covering six subjects as indicated in the following appendices. In addition, it reported progress on two other subjects, in Appendices F and G submitted, but which are not included here. These two latter subjects, which it was requested be reassigned, covered the design and construction of modern produce terminal buildings and the relative merits of wood and fireproof roof structures, including wood, hollow tile fireproofing, concrete and cement tile, etc.

The committee made no report on one of the subjects assigned to it—the use of welding in buildings, referring to its earlier extensive report, and recommended that the subject be dropped. No revisions of the Manual were suggested.

Appendix A—Specifications for Buildings for Railway Purposes

The committee presented the following specifications and addenda as information, with the statement that they will be submitted later for inclusion in the Manual: Section 30-A,

* Architect, Missouri-Kansas-Texas Lines

Steel chimneys; Section 30-B, Brick chimneys; Section 30-C, Reinforced concrete chimneys; Addenda A, Draft gages; Addenda B, Pyrometer; and Addenda C, Lightning protection system. It stated that it is holding in abeyance for further criticism and consideration, specifications published in Bulletin 323, as follows:

Section 10D, Types D1 and D2, Asphalt impregnated felt roofing over wood or precast gypsum and over concrete or poured gypsum respectively; and Section 28, Hydraulic elevators, baggage and freight.

It also stated that it now has in course of preparation, to be submitted at a later date, specifications for electrically operated freight elevators, screens for wood doors and wood and metal frame windows, and two additional specifications for asphalt impregnated asbestos felt roofing.

Appendix B—Various Types of Train Sheds

Based on answers received to a letter, the committee presented in tabular form data on the various types of train sheds constructed recently on the railways of the country and supplemented these with statements of the conditions which appear to influence the different designs and types of construction used.

In the latter part of its report it made the following recommendations, which were presented only as information:

Except for terminal stations where the Bush type shed is desirable, the committee recommends the use of the butterfly type, single-post construction, built so far as feasible of standard steel shapes, with smooth surface built-up roofing. Wrought iron conductor pipes should be used up to at least six feet above the platform, with the following factors given consideration:

When there are stairways in the center of the platform, use two-post construction with glazed windbreaks extending up to the under side of the roof. Where terminal platforms are used only by passenger trains, the roof may extend out to the gage line of the track and high enough to give clearance for cars and engines. For main line sheds, where both passenger and freight trains are operated, the roof shall extend out to the standard clearance line, and the height shall be only sufficient to clear loaded trucks and to provide for clearance for refrigerator car doors. In all cases the roof pitch should be only sufficient to give good drainage.

It was recommended that the subject be discontinued.

Appendix C—Freight House Doors

In a concise report, which the committee presented as information, the following types of doors, most generally used for freight, express, baggage and mail rooms, were described in detail, together with pertinent comments regarding their advantages and disadvantages: Ordinary wood, mill type, corrugated sheet metal, tin-clad, steel, rolling wood, rolling steel, overhead wood (light construction), overhead metal or wood (heavy construction), vertical lift (wood or metal), and continuous sliding. It was recommended that the subject be discontinued.

Appendix D—Sidewalks and Station Platforms

After collaborating with the committees on Masonry and Wood Preservation, the committee presented its report which dealt at some length with the various types of platforms used at passenger stations, freight houses and receiving, delivering and transfer points, covering not only factors governing the choice of type but also features of design and construction. The principal types of platforms considered were unpaved, wood, brick, asphalt of different forms, and concrete.

The committee recommended that its report be received as information and the subject discontinued.

Appendix E—Modern Methods of Heating Small Railway Buildings

The committee has been considering this subject broadly, to include a study of the comparative advantages of warm air, hot water, steam and fan unit systems. It reported that considerable information had been gathered and had been gone over with the general committee, but that more information is being sought, in view of which it recommended that the subject be reassigned for further study.

Appendix H—Specifications for Concrete in Buildings

Following is the brief report of the committee:

A report on this subject was presented at the 1931 convention and the specifications were published in Bulletin 334 with a view to their being published in the Manual later. Since no suggestions for changes or revisions have been received during the year, the committee recommended their adoption for publication in the Manual.

Action.—The presentation of this report by H. T. Dorrance (N. Y., N. H. & H.), subcommittee chairman, was the occasion of the discussion which at times bordered almost on the acrimonious. Meyer Hirschthal (D. L. & W.), chairman of the Committee on Masonry, contended that the adoption of the Building committee's specification would result in a duplication of specifications for concrete in the Manual, and read a resolution adopted by his committee, opposing the adoption of new specifications as unnecessary and a source of confusion. This position was supported by H. C. Crowell (Penna.), C. W. Baldridge (A. T. & S. F.) and others. B. R. Leffler (N. Y. C.) supported the Building committee, claiming that there is a difference in the requirements for concrete in buildings and bridges. F. R. Judd (I. C.), a former chairman of the committee, reviewed the history of the specifications, pointing out that the drafting of a separate specification was in accordance with a mandate of the Committee on Outline of Work. After further discussion, a motion by Mr. Baldridge that the specification be referred to the Committee on Masonry was carried by a rather close vote.

Report on Masonry

Meyer Hirschthal, Chairman*

The report of the committee covered six subjects as outlined in the following appendices. In addition, progress was reported on the subjects of contact with Joint Committee, clearances and expansion joints.

The committee also presented a resolution which it had adopted unanimously, informing the chairman of the Building committee and the Board of Direction of its opposition to the printing in the Manual of the specifications for concrete used in railway buildings, offered this year for adoption by the Committee on Buildings.

It was recommended that the revisions presented in Appendix A be approved for publication in the Manual, and that appendices B, C, D, E and F be received as information.

Appendix A—Revision of Manual

The committee recommended changes in Articles 7, 17, 22, 85 and 106, and additions to Articles 10, 15, 17, 31 and 86 of the specifications for Portland cement concrete, plain and reinforced, now appearing in the Manual, which changes, by reason of their detailed nature, are too lengthy to permit presenting here.

Action.—The report was presented by F. R. Leonard (Penna.), subcommittee chairman. No objection was offered to any of the changes proposed except a table of water-cement ratios for concretes of various strengths, which eliminated 1,500-lb. concrete from the table now in the Manual. J. B. Hunley (C. C. C. & St. L.) and B. R. Leffler (N. Y. C.) both contended that concrete of this class had a legitimate place and that it would be uneconomical to use better concrete in locations where a 1,500-lb. strength was adequate and was protected from the weather. Mr. Leonard countered with the statement that "there is no such thing as 1,500-lb. concrete that is worthy of the name." The report was then adopted without revision.

Appendix B—Principles of Design of Reinforced Concrete Arches

Last year the committee laid down a number of principles for the classification and design of reinforced concrete arches for railroad loadings, covering in full the subject of the classification of arches, and three main heads, general, loads and unit stresses, under the subject of design. This year it continued its consideration of design and, beginning where it left off last year, presented information under the following heads: Selection of form, preliminary selection of crown thickness, notations and symbols, and basis of design and formulae.

The committee stated that it is its intention to follow this year's report with a section covering the details of design and construction, and then to submit the entire subject-matter to the association in the form of recommended specifications.

Appendix C—Progress in the Science and Art of Concrete Manufacture

Following general introductory remarks with regard to the progress which is being made in the art of making concrete,

*Concrete Engineer, Delaware, Lackawanna & Western

the committee gave major attention to the selection of aggregates, pointing out the large effect which their durability has on the durability of the finished concrete in service and the importance of making a thorough inspection of the quarry from which stone is secured, as well as tests of the stone itself. This part of the report, which is well illustrated, shows some serious effects of unsound stone when used as aggregate in concrete, and presents tests developed to determine the suitability of aggregates for concrete manufacture. An important feature of the report, as pointed out by the committee, is that it relates the various tests to the behavior of the aggregate in the structure and to the weathering of the rock in the quarry from which the aggregate was obtained. The report also discussed the water-cement ratio and the cement factor in concrete manufacture; the water-cement ratio as affecting watertightness; safe working consistency and water gain; and curing as affecting watertightness.

Appendix D—Foundations

The committee developed and presented as information a detail of the procedure to be followed in determining the supporting capacity of soils. Following are the comments of the committee with regard to the factors affecting soil supporting capacity:

The supporting capacity of soils is dependent upon two elements, (a) the resistance of the stratum on which the footing rests and, (b) the rigidity of underlying strata within the range of depth affected by the loading. Each of these two elements is controlled by the character of the soil itself, the amount of water present and the degree to which the material is confined by overlying and surrounding formations. For this reason, a soil bearing test without borings or other examination of underlying strata is inadequate, and, therefore, both bearing tests and the probing of formations beneath the soil stratum directly affected should be included in the procedure to ascertain the supporting capacity of soil.

Appendix E—Lining and Relining Tunnels

In a progress report, presented for information only, the committee, collaborating with the Committee on Roadway, presented a summary of 55 replies received in answer to a questionnaire sent to all Class I roads, in addition to information received from certain foreign roads. The summary is of considerable scope and highly informative, but the committee stated that it is not prepared at this time to present any definite conclusions.

Appendix F—Methods of Repairing Deteriorated Concrete

Under this subject, the committee presented, as information, tentative specifications for repairing deteriorating concrete. These specifications are set up under the following heads: Scope, general, preparation of bonding surface, bonding (hand patching), anchorage, reinforcement, application of new concrete, color, curing and protection, and materials and workmanship.

Report on the Waterproofing of Railway Structures

J. A. Lahmer, Chairman*

In its first report, the special committee appointed to study the waterproofing of railway structures, reported on the following subjects: (1) Definitions (Appendix A); (2) When to waterproof or dampproof and methods to be used (Appendix B); (3) Waterproofing and dampproofing as applied to existing railway structures (Appendix C); and (4) Specifications for membrane waterproofing of concrete work, excepting the roofs of bridges.

It recommended that the definitions contained in Appendix A be adopted for inclusion in the Manual and that the subjects of appendices B and C, and Assignment 4 on which no detailed report was made this year, be reassigned.

Appendix A—Definitions

Following are the definitions prepared and recommended by the committee for adoption:

Waterproofing—The treatment of any material or structure to prevent the entrance or passage of water or other liquid under head.

Dampproofing—The treatment of any material or structure to prevent the entrance or passage of water or other liquid not under head.

Imperviousness—The quality of being completely resistant to penetration by water or other liquid.

Integral Waterproofing—The process by which any admixture other than the usual ingredients is added to a material in the process of manufacture for the purpose of increasing the watertightness of the product.

Pressure Waterproofing—The process by which a material is forced into the pores or cracks, or to the exterior or pressure side of a structure, for the purpose of making it watertight.

Membrane Waterproofing—The application of alternate layers of fabric, or felt, and bitumen to form a covering on a surface for the purpose of preventing the entrance of water or other liquid under head.

Surface Coating—The application of a liquid by brush or spray for the purpose of waterproofing or dampproofing.

Metallic Waterproofing—The application to a surface of a mixture of a metal and a reagent, the chemical reactions of which tend to fill the pores.

Action.—The definitions were adopted for inclusion in the Manual.

* Senior Assistant Engineer, Missouri Pacific

Records and Accounts

C. C. Haire, Chairman*

The subjects given major consideration by the committee during the year are reported on in the following appendices. In a brief report on revisions of the Manual, the committee stated that it had continued its work and that it will endeavor to present next year detailed recommendations that will come about necessarily because of the Depreciation order and the new classifications set up by the I.C.C. In a brief report on the system of reports and records required to budget and control maintenance of way expenses, the committee stated that in view of the probable effect of the Depreciation order and the probability of a new classification of accounts, it felt that it was not justified in making a detailed study and report this year. No reports were made on assignment designated F-1 (Changes or revisions in I.C.C. classification of accounts) and Assignment F-4 (practices to be followed in preparing data for rate and other cases with respect to valuations, allocation of operating and maintenance costs to various zones, and allocation of costs to specific services performed.)

Appendix A—Bibliography on Subjects Pertaining to Records and Accounts

This report contained a bibliography of books, papers and articles dealing with valuation, accounting and maintenance of way machines.

Appendix B—Drawings and Drafting Room Practices

In a progress report on this subject, which is new this year, the committee presented as information an outline of its proposed plan of procedure.

Appendix C—Methods and Forms

Under this head the committee considered forms for maintaining a record of railway, highway and private grade crossings and for making annual reports of grade crossings added or eliminated. It presented three forms as Exhibits 1, 2 and 3. Exhibit 1 was a form for making annual reports of highway grade crossings added or eliminated. Exhibit 2 was a form for recording data with reference to individual highway grade crossings and furnishes the underlying information with which to compile the form given in Exhibit 1. Exhibit 3 was a form designed for the purpose of recording information (with certain changes approved by the Committee on Grade Crossings) called for in the report of the Committee on Grade Crossings in Vol. 32 of the proceedings, Page 84. It was suggested that this latter form be used only in connection with special investigations. The committee recommended that its report be accepted as information and the subject discontinued.

Action.—In the absence of Subcommittee Chairman W. W. James (C. R. R. of N. J.), the report was presented by E. S. Butler (K. C. S.) and the two forms, Exhibits 1 and 2, were approved for publication in the Manual.

Appendix D—Bridge Inspection Report Forms

Last year the committee presented as exhibits three new bridge inspection forms covering masonry and steel bridges and trestles; wooden boxes and pipe culverts; and a sum-

*Auditor Capital Expenditures, Illinois Central System

mary form for compiling daily inspection reports. During the last year the committee was not able to come into full agreement on the forms with all four of the committees with which it was instructed to collaborate, and it was necessary for it to ask that the subject be continued for another year.

Appendix E—Statistics Required by the Different Departments with Respect to Maintenance of Way

Collaborating with the proper committees, the committee advanced its work during the year to consideration of the statistical requirements of the different departments covering work equipment and special machine operations in the maintenance of way department. In its report this year, which was offered as information, it gave special attention to the requirements of the division engineer, the engineer maintenance of way and the accounting department.

Appendix F—Forms Used by Water Service Department

Continuing past consideration of this subject, and supplementing a form covering the Cost of Water Production, presented last year, the committee, in a progress report, presented as Exhibit 1, a monthly report of water station operation, a form which provides for the daily recording and monthly reporting of water production and consumption. The form covers water production only, the committee stating that it found it inadvisable and impractical to try to utilize this form for reporting water treating data also.

Appendix G—Keeping Valuation and Other Physical Property Records Up-To-Date

Dealing with forms of record of side tracks, the committee referred to three forms already in the Manual and proceedings, and, pointing out that two of these were either little used or inconvenient to use, it presented a new form entitled, "List of Side Tracks," which was shown as Exhibit 1. As Exhibit 2 it presented a continuation sheet for the form shown in Exhibit 1.

The committee also presented two other forms; one, "Register of Authorities for Expenditures," to supersede a more or less similar form, but of less than standard size, now in the Manual; and the other "Detailed Estimate," to supersede a more or less similar form which appears in the proceedings, Vol. 29, Page 882. These new forms were presented as Exhibits 3 and 4.

Under this appendix the committee presented the results of its study of the possible economies that may be effected through the elimination of certain records or the substitution of some records for others as required under Valuation Order No. 3, Second Revised Issue, and its Supplements. It also made a report of its study to find some short and simple method of handling the numerous items in Account No. 10—"Other Track Material," which would produce results sufficiently accurate for all practical purposes, and at the same time eliminate, in so far as possible, the mass of minute detail involved in recording and reporting the changes in this account.

The report of the committee was submitted as a progress report only.

Appendix H—Methods and Forms for Keeping Record of Changes in Joint Interlocking Plants

Collaborating with the Committee on Signals and Interlocking, the committee, in its report this year, again emphasized the necessity for defining accurately in every contract or agreement for jointly owned interlocking plants, the original division of ownership and the proper participation in joint ownership resulting from changes in the facility, and also the importance of keeping records straight. To this latter end it presented, as Exhibit 1 in its report, a new form to serve as a guide in maintaining the desired records at joint interlocking plants to enable the determination of the varying percentages of ownership from year to year as changes are made in such joint facilities. This form was submitted as information and it was recommended that the subject be discontinued.

Appendix I—Methods Used in Recapture Proceedings

In a progress report, the committee reviewed important matters having bearing on this subject since its report in 1930, particularly as regards action on the part of the I.C.C. and Congress, and then submitted in full the final decision of the commission in the case of recapture on the Richmond, Fredericksburg & Potomac.

Appendix J—Methods and Forms for Handling Depreciation Charges of Steam Railways

Stating that the final report on depreciation charges of steam railways was served on the railways in the early part of September, 1931, the committee, in a progress report, pointed out the major requirements on the railways in connection with the new depreciation order. It made reference to the early history of this subject, as reported by it in 1929 and 1930, and then presented an analysis of the new order, dealing more specifically with those ordering paragraphs which differ from those in the depreciation order issued in 1926.

Appendix K—Simplifying and Co-Ordinating Accounting, Valuation and Depreciation Work

In a progress report, the second report on this subject, the committee presented a discussion of the form of organization of the I.C.C., and also that of the railways, with the idea of illustrating the present situation in this regard which results in a certain amount of duplication of effort in meeting the requirements of the commission. As Exhibit A, it submitted a detailed organization sheet of the I.C.C.

As a result of its study thus far, the committee came to the following general conclusions:

(1) That the manner in which the commission is organized causes some duplication of effort by carriers in accounting, valuation and statistical work, which may now become more extensive with the new depreciation requirements.

(2) That the committee is of the opinion that the commission is partly alive to this situation.

(3) That the carriers may themselves cause duplication and lack of simplification by their own methods of organizing to comply with the requirements.

Report of Committee on Ballast

A. P. Crosley, Chairman*

The six subjects of the following appendices were reported upon by the committee, which also stated that it had been giving special consideration to the ballast sections appearing in the Manual with the idea of recommending certain changes later.

Appendix A—Specifications for Prepared Gravel Ballast

The principal work of the committee on Prepared Gravel Ballast has consisted of the collection of information to assist in the formulation of specification clauses to cover such factors as resistance to abrasion and to the action of the weather. In the study of the first problem, the revision of the present specifications to include clauses covering abrasion and durability, the committee has had conducted detailed tests to determine the physical characteristics of several samples of gravel ballast. This work has been carried out by W. L. Foster of the Iowa State College, Ames, Iowa, and Stanton Walker of the National Sand and Gravel Association, Washington, D. C., members of the committee.

The report, which was submitted as information, consisted mainly of an analysis of these tests. It was said that the results of certain of the tests carried out by Professor Foster have been presented to the committee but that the committee did not have time to summarize them for inclusion in this year's report.

Appendix B—Specifications for Stone Ballast

Since their adoption last year, the committee has given considerable study to the specifications for stone ballast and, as a result, made three recommendations concerning them this year. It asked that Sections 6 and 24, dealing with cementing value, be removed, and that Section 9 covering selection and samples, "Each stratum of a quarry shall be tested separately and not averaged with other stratum," be changed to read as follows: "Each stratum or portion of a quarry containing a variation in quality of stone shall be tested separately and not averaged with other stratum or portion of the quarry." Under Section 10, "Averaging," it recommended that the number of tests required be changed from five to three.

Action.—In the absence of Subcommittee Chairman A. A. Johnson (D. L. & W.), the report was presented by J. M. Podmore (N. Y. C.), C. W. Baldridge (A. T. & S. F.) and F. M. Thomson (M-K-T) took exception to the elimination from the specification of the provision which referred to the cementing value of stone ballast, and the association voted to retain this provision. The remaining revisions were approved.

* Division Engineer, Reading—Harrisburg, Pa.

Appendix C—Shrinkage of Ballast

After reviewing the history of its activities and its present assignment, which it has interpreted to be the determination of the amount of shrinkage of ballast from its measurement in a car at its point of origin, to its measurement tamped and compacted in the track under traffic, the committee explained its present efforts through test installations on different roads to establish correct figures, and presented in tabular form the progress made in these shrinkage tests. The committee pointed out the necessity for further tests before it could hope to draw any definite conclusions. The report was submitted as information with the recommendation that the subject be discontinued.

Appendix D—Cost of Maintaining Track on Various Kinds of Ballast

The committee sent out a questionnaire concerning the comparative cost of maintaining track on various kinds of ballast and found that only one road could give accurate detailed figures on the subject. Confining its attention to stone and gravel ballast during the year, the committee presented as information in detailed tabular form comparative cost figures for two sections of line over a period of four years. Pointing out that the physical characteristics, number of trains and tonnage over the two sections was identical, the committee thought the comparative data of considerable value.

Appendix E—Proper Depth and Kind of Ballast

Following a reprint of a questionnaire sent out, the report contained a number of comments by the committee, based on the answers received to the questionnaire. These contained, among others, the naming of materials suitable for sub-ballast; an expression of the feeling that ballast materials of smaller aggregates than may be proper for top-ballast are more suitable for sub-ballast than materials of larger aggregates; such as broken stone and crushed slag; and the opinion of the committee that a combination of top- and sub-ballast will, with few exceptions, give better results than the use of straight top material for the entire depth. The committee suggested for adoption a change in the statement in the Manual under the heading, "Proper Depth of Ballast."

Report on Track

C. R. Harding, Chairman*

The committee presented detailed reports on six subjects as stated in the following appendices, and, in addition, reported progress on five other subjects as follows: Specifications for soft steel track spikes; the string lining of curves; the corrosion of rail and fastening in tunnels; the gage of track and the elevation of curves, with reference to the use of roller bearings on railway equipment; and the effect of existing materials in track on the design and punching of tie plates, together with the interrelation of the slotting of joint bars and the size of track spikes.

Appendix A—Revision of Manual

The committee made the following recommendations: That the Index to A. R. E. A. Trackwork Plans and Specifications, Pages, I, II, III and IV, dated March, 1930, be revised by the substitution of the revised index dated 1932, Pages, 1, 2, 3 and 4, listing existing plans and specifications and including the new plans presented in Appendix E, and omitting plans that are recommended below for withdrawal; the revision of plans Nos. 273 to 279 inclusive, dated November, 1928, covering Nos. 6 to 12 frogs, inclusive, for heavy rails (solid manganese steel, bolted rigid, spring rail and solid manganese), by the substitution of revised plans of the same numbers, dated September, 1931; and the revision of plans Nos. 401, 402 and 403, dated September 15, 1919, and plan No. 404, dated September, 1929, by the substitution of revised plans of the same numbers, dated September, 1931.

It also recommended that plan No. 501, dated November, 1920, covering details of guard rails, 8 ft. 3 in., 11 ft. 0 in. and 16 ft. 6 in., be withdrawn, in favor of substitute plans Nos. 503 and 504 referred to in Appendix E; the revision of plan No. 502, dated November, 1920, by the substitution of a revised plan of the same number dated September, 1931; and that plans Nos. 305, 308, 420 and 321, covering Nos. 6, 7, 8 and 10 bolted frogs, Nos. 11, 16 and 20 bolted rigid frogs, data for layout of spring rail frogs, and tie layout for standard length rigid frogs, be withdrawn.

Furthermore, the committee recommended certain minor changes in the track tool plans Nos. 1, 2, 6, 8, 9, 10, 12, 17, 18, 19 and 21, dated September, 1929.

Action.—Mr. Harding, who also acted as chairman of this subcommittee, presented the report, which was approved.

Appendix B—Revision of Specifications for Steel and Malleable Iron Tie Plates

The committee reported that it has had under consideration the revision of specifications for steel tie plates to provide for shoulder height tolerance, but that it has decided that the absence of such tolerances from the present specifications does not appear to impair their value, and, therefore, asked that the subject be dropped.

It also reported that it had been asked to revise in several respects present specifications for malleable iron tie plates, but that it had decided to hold back on this to await the action of the Mechanical Division, A. R. A. on the specifications for malleable iron now before it.

Action.—Subcommittee Chairman E. D. Swift (Belt Ry. of Chicago) submitted the matter in this report and all the recommendations were approved.

Appendix D—Track Tools

The committee presented plan No. 4-A, dated February, 1930, covering wrenches for the new style A. S. A. nuts, which it recommended be adopted for inclusion in the Manual to supplement present plan No. 4 for old style nuts.

Action.—G. M. Strachan (A. T. & S. F.), chairman of the subcommittee, submitted the report and the recommendation of the committee was adopted.

Appendix E—Plans for Switches, Frogs, Crossings, Slip Switches, Etc.

Following comments on specific plans under consideration during the year, the committee presented and recommended that the following plans be adopted as recommended practice and printed in the Manual:

Plans Nos. 258 to 264, inclusive, dated September, 1931, for Nos. 6 to 12 frogs for medium weight rails (railbound manganese steel, bolted rigid, spring rail, and solid manganese steel).

Plans Nos. 265 to 267, inclusive, dated September, 1931, for Nos. 14, 15 and 16 frogs for medium weight rails (railbound manganese steel and bolted rigid).

Plans Nos. 268 and 269, dated September, 1931, for Nos. 18 and 20 frogs for medium weight rails (railbound manganese steel).

Plan No. 326, dated September, 1931, Details of tie plates and base plates for railbound manganese steel, bolted rigid and solid manganese steel frogs for medium and heavy weight rails.

Plan No. 503, dated September, 1931, Guard rails, tee rail design, with bent flares.

Plan No. 504, dated September, 1931, Guard rails, tee rail design, with planed flares.

The committee presented as information plans Nos. 256 and 257, dated September, 1931, Nos. 4 and 5 frogs for medium weight rails (railbound manganese steel, bolted rigid and solid manganese steel).

Action.—Subcommittee Chairman O. F. Harting (Term. R. R. Ass'n. of St. L.) submitted the matter in this report and all the recommendations were approved.

Appendix F—Track Construction in Paved Streets

Under this head the committee presented for information and criticism plans Nos. 987 and 988, showing connected straight tongue switches for main line use and industrial tracks, (7-in. and 9-in. girder rails), for use with through turnouts, (4 ft. 8½ in. gage), as referred to in note on plan No. 980, alinement details for turnouts, tongue switch construction, for use in paved streets.

Appendix J—Standard Wheel Flanges, Treads and Gages

Along with a statement of the work of the committee during the year, which included field work and conferences with representatives of the Mechanical division, A. R. A. and of the Association of Manufacturers of Chilled Car Wheels, the committee presented Plan No. 790, dated September, 1931, A. R. E. A., Data for gages and flangeways through track at frogs and crossings, showing limits where gage is not widened for curvature.

Action.—J. V. Neubert (N. Y. C.), chairman of the subcommittee, presented this report and asked that the material be received as information and the subject be reassigned to the committee for further study.

* Assistant to President, Southern Pacific

Report on Rail

Earl Stimson, Chairman*

The committee presented reports covering ten subjects as stated in the following appendices. It also reported progress in its study of the economic value of different sizes of rail; specifications for spring washers; and the relative merits of rail sections heavier than 100 lb., from the standpoint of the economic distribution of metal and strength.

The committee recommended that the revision in Appendix A be approved for publication in the Manual; that the addition to the Manual recommended in Appendix H be approved; and that appendices B-1, B-2, C-1, C-2, G, J and K be received as information. Appendix D was submitted as a progress report.

Following the presentation of the report of the committee, Prof. H. F. Moore (U. of I.), who is in charge of the laboratory work in connection with the joint committee's investigation of the cause of transverse fissures and other defects in rail, explained the present status of this phase of the investigation and the methods that are being developed to determine the physical characteristics of rails in which transverse fissures have occurred.

Appendix A—Revision of Manual

The main revisions recommended by the committee were the changing of the term "Horizontal Fissure" Page 139, 1929 Manual, to "Horizontal Split Head," and a change in this term as used in the definition of a compound fissure. Consideration was given to the further revision of Form 402-C for reporting rail failures but no change was recommended at this time.

Action.—In the absence of Subcommittee Chairman A. F. Blaess (I. C.), the report was presented by Mr. Stimson. C. W. Baldridge (A. T. & S. F.) took exception to the use of the term "fissure" to designate any type of defect except transverse fissures. His motion to eliminate the term "Compound Fissure" was lost and the revisions recommended by the committee were approved. At this time the revisions proposed in Appendix H were also approved.

Appendix B-1—Mill Practice

The report of the committee consisted of a brief resumé of the work done this year on the joint investigation of transverse fissure rail failures by the rail manufacturers and the Rail committee, an investigation just getting well under way. It also outlined the scope of the investigation and presented a general outline of the work to be undertaken.

Appendix B-2—Operating Results of the A. R. A. Rail-Fissure Detector Car

In a brief report, the committee advised of the fact that the A. R. A. detector car had been completely overhauled during the year, and then presented details with regard to the performance of the car and the rail defects of different types which it has detected since it was put in operation in November, 1928.

Appendix C-1—Rail Failure Statistics for 1930

Rail-failure statistics were presented by W. C. Barnes, engineer of tests for the committee, for the year ending October 31, 1930, compiled in accordance with the standard method of basing the failure rate on mill years of service in track As in past years, an analysis was given of the rollings by mills, and the report included a number of charts, diagrams and tables showing various trends in failure rates.

Appendix C-2—Transverse-Fissure Statistics

The report on this subject was compiled by W. C. Barnes, and included several tables and charts. The record of transverse fissures reported, as given in the report, follows:

The accumulated total of transverse fissures reported to December 31, 1930, from all rollings, was 50,746, compared with a total to January 31, 1930 of 44,035, or an addition during the 11 months of 6,711, making an average rate of 20 failures per day. This is an increase of 473 over the preceding year's total of 6,238.

Appendix D—Cause and Prevention of Rail Batter

The committee reported that it is proceeding with the development of the heat-treating of rail ends for the purpose of eliminating, or, at least, reducing the rate of rail end batter, and that field tests are being started.

Appendix G—Tests of Alloy and Heat-Treated Carbon Steel Rails

The report of the committee consisted essentially of two exhibits. The first included summaries showing the amounts of intermediate manganese rail purchased during 1931 (61,312 tons), also amounts purchased previously and the total amounts to date (711,582 tons), tabulated both by roads and by mills. The second exhibit presented a summary of the failures to date, from which it is noted that the majority of the failures reported are head failures and transverse fissures.

The report also included reference to the use of heat-treated rails during 1931 and the progress which has been made in this development.

Appendix H—Order of Stamping of Heat Number, Rail Letter and Ingot Number on Rail

The committee reported that certain rail manufacturers had objected to the arrangement of the stamping shown in the drawing submitted last year illustrating the typical branding and stamping recommended by the committee, but that after further discussion with these manufacturers their objections have been withdrawn. The committee, therefore, recommended that the words "arrangement thereof" appearing at the end of the first line under the heading "Typical Stamping" on Page 353 of the 1931 Proceedings, which words were eliminated at the last convention, be reinstated for publication in the Manual.

Appendix J—Revision of Method of Rating Failures

Because of criticism of the practice of the committee of including in the general rail failure and transverse fissure statistics certain mill rating charts (Appendix C-1), in which the failure rates on a simple mileage basis have been modified by the use of average traffic density factors derived from I. C. C. reports on main line average traffic density, the committee gave consideration to a possible change. After study of the complaints, answers to which are made in the report, the committee stated that no method of improving the present basis of rating had been found practical, and that it recommended, therefore, no change in the method now used.

Appendix K—Specifications for Intermediate Manganese Steel Rail

While not regularly assigned to it, the subject of the preparation of specifications for intermediate manganese steel rail was investigated by the committee. It found that the largest purchasers and users of intermediate manganese steel rail are not in agreement as to the composition best suited for this material and that they will continue to experiment with compositions differing from those which they have been purchasing in the past. In view of this, the committee said that the preparation of specifications for intermediate manganese steel will be deferred until definite knowledge of the most suitable composition is available.

*Chief Engineer Maintenance, Baltimore & Ohio

Report on Wood Preservation

F. C. Shepherd, Chairman*

The committee gave consideration to the seven subjects reported on in the following appendices.

It recommended that the changes in the Manual recommended in Appendix A be approved; that Appendices B, C, D, E, and F be received as information and the subjects continued; and that Appendix G be received as information and the subject dropped.

A supplementary report of the committee was read into the record at the convention by G. C. Stephenson (Koppers Products Company) on the inspection of test sections of mixture treatment ties on the Atchison, Topeka & Santa Fe in the southwest. In the opinion of the subcommittee, creosote-petroleum mixture treatment gives added protection to ties in the territory embraced in the test.

Appendix A—Revision of Manual

The committee recommended a change in the description of the apparatus for determining coke residue in creosote oil, appearing in the 1929 Manual, Page 1308, and that new specifications which it presented be substituted for specifications for

*Consulting Engineer, Boston & Maine

the specific gravity of creosote fractions now appearing in the 1929 Manual.

Action.—E. B. Fulks presented the report and the changes proposed were adopted.

Appendix B—Service Test Records for Treated Ties

The committee's report this year included its usual table of tie renewals per mile maintained on various roads, brought up to include renewals for 1930, and a number of reports on special test sections on the Atchison, Topeka & Santa Fe, the Baltimore & Ohio, the Chicago, Burlington & Quincy, the Canadian National, the Chicago & North Western, the Chicago, Milwaukee, St. Paul & Pacific and the Northern Pacific. It also included a report of an inspection by S. R. Church of red oak ties, treated with heavy creosote on the Louisville & Nashville.

Appendix C—Piling Used For Marine Construction

The report of the committee was based on recent inspections of long time test pieces prepared by the Chemical Warfare Service, by some of its own members and by other co-operators. A new series of tests was reported under the direction of the Chemical Warfare Service, in which test pieces treated with different materials or combinations of materials were installed at nine widely scattered points. A first report on the copper resinate tests was also made.

Appendix D—Destruction by Termites and Ways of Preventing Same

The committee again pointed out the seriousness of attacks by termites, and also the fact that where proper precautions are taken at the time a building is constructed, termites can be absolutely stopped. As a part of its report, the committee reprinted a circular published by the U. S. Department of Agriculture, entitled, "Scientists Warn Home Owners of Termite Frauds."

Appendix E—Effect of Weed Burners on Treated Ties

The report detailed experiments made on several roads during 1930 and 1931 to determine the loss of preservative in treated ties due to the repeated use of oil-burning weed destroyers. The committee concluded that the experiments indicate that little actual loss of preservative may be expected from the normal operation of weed burning machines, but that damage to the ties could be considerable through their careless operation.

Action.—R. C. Bardwell (C. & O.) called attention to the fact that the tabulation of the effect of weed burners on ties showed greater loss of weight for unburned ties than for burned ties, leading to the conclusion that the test was not as reliable as it should be, and suggested reassignment of the subject to the committee.

Appendix F—Incising of Forest Products Material

In its report this year the committee cited past experience in the incising of ties on several roads and commented on recent tests made in Canada. The results of this practice appear to be so indefinite that the committee submitted plans for further detailed investigation which it felt was necessary before any definite conclusions can be drawn.

Appendix G—Extent to Which Decay is Permissible in Ties for Treatment

In a quite lengthy discussion of this subject, the committee indicated its objection to modifying specifications to permit accepting ties with any defects and, likewise, its disapproval of treating ties which show signs of decay.

New Officers

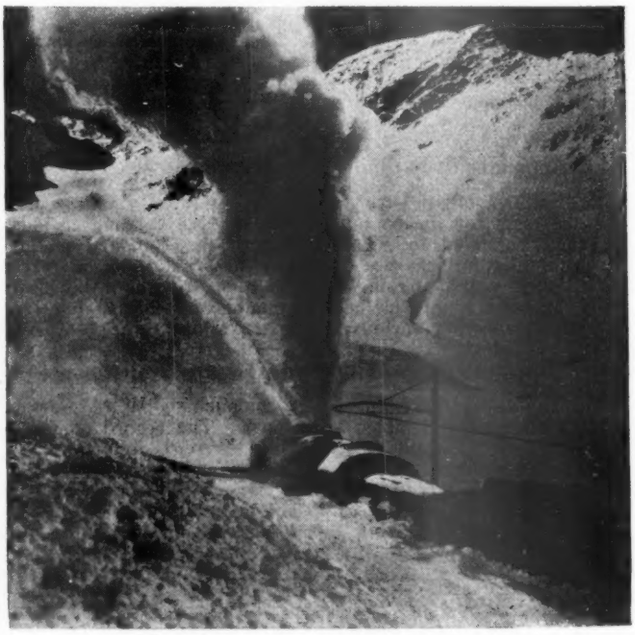
In the election of officers, reported at the closing of the convention, J. V. Neubert, chief engineer maintenance of way, New York Central Lines, was elected president and J. E. Armstrong, assistant chief engineer, Canadian Pacific, was elected second vice-president; W. P. Wiltsee, chief engineer, Norfolk & Western, (second vice-president), being advanced automatically to first vice-president. In addition, A. N. Reece, chief engineer, Kansas City Southern; J. C. Irwin, valuation engineer, Boston & Albany; and E. M. Hastings, chief engineer, Richmond, Fredericksburg & Potomac, were elected directors; while E. L. Crugar, chief engineer, Wabash, W. T. Dorrance, assistant to chief engineer, New York, New Haven & Hartford; C. P. Richardson, engineer track elevation, Chicago, Rock Island & Pacific; J. W. Orrock, engineer of buildings, Canadian Pacific; and C. B. Bronson, assistant inspecting engineer, New York Central Lines, were elected to the Nominating committee. E. H. Fritch, the secretary, and A. F. Blaess, chief engineer, Illinois Central, the treasurer, were re-elected.

Larger Dimensions Now Available for Wrought Iron

WROUGHT iron plates are now available in a range of thickness, widths and lengths that have not been on the market for 25 years. This is one of the tangible results growing out of the introduction of the Aston process for the quantity production of genuine wrought iron. This process, which is controlled by the A. M. Byers Company, Pittsburgh, Pa., has been actively applied by that company with a resulting increase in productive capacity so that wrought iron can now be applied to purposes for which it has been prohibitive for many years.

Sheared plates are now available in thicknesses ranging from 3/16 in. to 1 in., in widths up to 84 in. and in lengths up to 400 in., in accordance with a standard table of extreme sizes. Universal plates, covering the same range of thicknesses, are also being rolled in lengths ranging from 220 in., for a plate 46 in. wide and 1 in. thick, to 720 in. for plates 13 in. and 14 in. wide in all thicknesses. Sheets are also being rolled in standard commercial sizes in all gages from No. 28 to No. 10 and may be had either black or galvanized.

* * *



A Rotary Snow Plow on the Electrified Bernina Railway, Between St. Moritz, Switzerland, and Tirano, Italy

NEWS

N. R. A. A. Holds Meeting at Chicago

Considers plans for exhibit in March, 1933—New officers elected

The National Railway Appliances Association will hold its annual exhibit in Chicago in March, 1933, in connection with the annual meeting of the American Railway Association, unless unforeseen difficulties that may arise during the year prevent such action, according to A. S. Anderson, vice-president and general sales manager of The Adams & Westlake Company, and president of the association. In his report, at the annual meeting of the association in Chicago on March 14, Mr. Anderson explained that following a survey of the membership it was decided not to hold an exhibit this year; and in order to make certain that the association could function through this period of inactivity, the members were assessed $100 each. "We feel," he said, "that the 1933 exhibition should be anticipated and if the A. R. E. A. holds its convention, we will consider holding our exhibition. We are mindful of the fact that some exhibitors may desire to participate in the World's Fair exhibit, but have been reminded that this will be the case with comparatively few, and that if the time of opening the Century of Progress is June 1, as is anticipated, our exhibition will have been completed."

Officers elected for the ensuing year are: President, Frank McAllister, president of the Kalamazoo Railway Supply Company; vice-president, Alex Chapman, district sales agent of the Rail Joint Company; treasurer, C. W. Kelly, re-elected. Four directors were elected, two for a term of three years and two to fill vacancies of unexpired terms. E. E. Thulin, district manager of the Duff-Norton Manufacturing Company and W. Homer Hartz, president and treasurer of the Morden Frog & Crossing Works, were elected for three years, while M. C. Beymer, secretary of the Oxweld Railroad Service Company, was elected to serve the unexpired term of Alex Chapman for one year, and C. H. Wilson, in general charge of railroad sales of Fairbanks, Morse & Co., to serve the unexpired term of P. H. Gilliland for two years.

The Membership committee reported 122 paid memberships as of March 14, 1932, 67 of whom, on November 12, 1931, had been assigned space comprising 75 per cent of the entire area available. Fifty-two members have already paid the assessments, while 27 more have expressed themselves as intending to do so.

The meeting voted to change Article V, Section 1 and Article V, Section 2 of the by-laws. Section 1, which provides that each member shall pay an annual membership fee of not to exceed $50, was changed to read, "Each member of the association shall pay an annual membership fee, the exact amount of which shall be fixed by the Board of Directors." The change in Section 2 provided for the ending of the fiscal year on March 30, instead of April 30.

C. W. Kelly, secretary-treasurer, gave a detailed report which showed that the association would close its 1932 year on April 30 with a small balance, and with assessment funds intact and available for the 1933 exhibit to the extent of $5,200.

Another matter brought before the meeting was the question of co-operating with the Railway Business Association, which may move its headquarters to Chicago and engage in an extensive campaign to better the present unsatisfactory situation of the railways. It was felt that since the purposes of the associations did not conflict, the problem of co-operation should be handled by the board of directors after studying the problem in conjunction with members of the Railway Business Association.

Railway Employment in January

A further reduction of 25,000 in the number of employees of Class I railways took place between the middle of December and the middle of January, according to the preliminary statement issued by the Interstate Commerce Commission. As of the middle of January the number was 1,108,699, a decrease of 16.88 per cent as compared with January, 1931.

Emergency Master Tariff To Be Re-Issued

The Interstate Commerce Commission has authorized the railroad tariff-publishing agents to publish a re-issue of the master tariff which covers the emergency increase in freight rates authorized in Ex Parte No. 103. The tariff with a large number of detail changes may be put in effect on short notice.

Use of Motor Vehicles For Mail Service

The House of Representatives on March 9 passed a bill to authorize the Postmaster General, in his discretion, to permit "railroads and electric car companies" to provide mail transportation by motor vehicle over highways in lieu of service by railroad train, the compensation for such service to be at a rate not in excess of the rate that would be allowed for similar service by railroad or electric car.

Oppose Railways, Favor Competitors

N. Y. Shippers' Conference against rail merger, water transport control, higher truck tax

While many spokesmen for shippers declare themselves in favor of "co-ordination" of the various agencies of transportation, it still appears that many of those who voice the "shippers' viewpoint" from the hustings or the witness chair are not in favor of any co-ordination which would subject the railways' competitors to the sort of regulation which the railroads have to tolerate, or would to any considerable extent free the railroads from any of their present restraints or in any way endanger real or fancied advantages to shippers arising from existing competitive chaos. The prevalence of this viewpoint among the more vocal element of the traffic fraternity in New York is instanced in two recent pronouncements of the Shippers' Conference of Greater New York—the one opposing the regulation of intercoastal shipping and the other opposing railway consolidation in Eastern territory.

The action of the conference on proposed regulation of intercoastal shipping was aimed at the bills introduced in the Senate by Senator Hiram Johnson which would require publication of and strict adherence to tariffs and would limit the cargoes of ships owned by industries to those industries' own products. The conference definitely recorded its opposition to such regulation of shipping which, however, by inference, is assumed to be quite proper and desirable in the case of the railroads. The report on these bills was presented by Parker McCollester, an attorney specializing in commerce cases who is chairman of the legislative committee of the conference.

"Steamship operations," the report read, "are conducted under circumstances entirely different from those of railroad operations and which make railroad regulation feasible. In the very nature of water tonnage conditions from time to time exist making it economically advisable for ships to secure freight for an individual voyage at a very low rate, such as when cargo is needed for ballast or for some other reason, which rate the line could not economically maintain on general business.

"Shippers should not be deprived of the advantages resulting from such rates as steamship lines are able to offer under these extraordinary circumstances. It is doubtful whether the bill as drafted would apply to tramp steamers, the de-

termination of this question probably depending upon whether, in an individual case, a tramp steamer is a common carrier or not. There are probably many steamers which are not common carriers and so long as these exist it does not seem feasible to attempt to obtain regulation of steamships which are common carriers."

The report in opposition to consolidation was presented by W. J. Mathey, committee chairman and manager of the traffic department of the Publishers' Association of New York. Many objections to the proposed four-system plan in the East were raised, the principal one apparently being that the shipper has greater advantage in dealing with a multitude of competitors than with a fewer number which have been strengthened by consolidation.

"It has been the experience of shippers," the report reads, "that their transportation problems receive more sympathetic consideration from transportation companies, the size of which is not so great as virtually to prohibit the establishment of personal contact with officials clothed with a considerable measure of discretionary power. Large enterprises, whether private or governmental, have a tendency to become bureaucratic and coldly impersonal in their relations with others. Experience has shown that this tendency is inevitable and we believe it raises a doubt as to the wisdom of increasing further the size of our largest railroad companies and of removing entirely from the field all companies of moderate size."

The "unhappy fate" of the "constructive" freight stations in New York and the failure of the railroads, after years of conferring, to reach any agreement regarding store-door delivery were likewise cited against them as reasons for the belief that "in order to compose their differences to rail carriers are at times willing to adopt measures in which the interests of the shippers and general public are disregarded."

After the adoption of these reports, and rounding out its evident policy of no lightening of railway regulation and no tightening of that on railway competitors, the conference voiced its opposition to increased taxation of motor trucks in New York State.

W. J. Mathey has been elected chairman of the conference, succeeding W. H. Chandler, manager of the traffic bureau of the New York Merchants Association, who has headed the shippers' conference for the past five years.

Effective Date of Depreciation Order Postponed

The Interstate Commerce Commission, on petition of the railroads, has postponed for one year, i.e., to January 1, 1934, the effective date of its order requiring depreciation accounting.

Six-Hour Day Resolution Passed

The Senate on March 11 passed without discussion the resolution previously passed by the House directing the Interstate Commerce Commission to investigate the effect upon operation, service and expenses of applying the principle of the six-hour day in railway employment. The resolution was signed by the President on March 15.

Labor Executives Meet In Washington

A three-day meeting of the Railway Labor Executives' Association was begun at Washington on March 15 for the consideration of the endorsement of candidates for election to Congress and other problems affecting railway labor.

Great Lakes Regional Board

The Great Lakes Regional Advisory Board will meet at the Commodore Perry Hotel, Toledo, Ohio, on March 23. Carl R. Gray, Jr., vice-president of the Chicago, St. Paul, Minneapolis & Omaha will be the principal railroad speaker. Paul Block, newspaper man, will be the speaker at the noon day luncheon.

Wage Statistics for December

Class I railways reported to the Interstate Commerce Commission a total of 1,133,928 employees as of the middle of the month of December and a total compensation for the month of $154,339,180. Compared with the returns for the corresponding month of 1930 this summary shows a decrease of 222,630 in the number of employees, or 16.41 per cent, and in the total compensation a decrease of $38,829,605 or 20.1 per cent.

To Broadcast From Moving Train

Radio broadcasting of a regular program of entertainment from a moving train will be undertaken on March 27, from 9 to 9:30 p.m. E.S.T. The studio will be a dining car in a Baltimore & Ohio train running between Washington, D. C., and New York. The furniture in the car will be supplanted by a 12-piece orchestra, vocalists and announcers performing before a microphone suspended from the ceiling. The kitchen and pantry will house a short wave transmitter and control board. The antenna to be used projects above the roof and extends the full length and across one end of the car. The program sent out from the car on short wave will be picked up by two stations, one at Beltsville, Md., 10 miles from Washington, and the other at Laurel, Md., 20 miles from Baltimore. From Laurel, the program will be sent by wire to radio broadcast station WABC in New York and a nation-wide network. The broadcast will be attempted while the train is running at speeds varying from 40 to 70 miles an hour.

The Baltimore & Ohio announces that this attempt will mark a departure in radio science and that if the attempt be successful, it will be the first time that a regular complete radio program of entertainment similar to those sent out from permanent studios has been transmitted from a temporary studio aboard a train.

Hearings to Be Held on Pension Bill

Hearings on the bill proposing a compulsory pension plan for railway employees, as drafted by the Railway Labor Executives' Association and introduced in Congress by Senator Wagner and Representative Crosser, will be held in April before a sub-committee of the Senate committee on interstate commerce, Senator Wagner has announced. The subcommittee consists of Senators Wagner, Brookhart, Glenn, Hastings, and Wheeler.

Loss and Damage Decreases

Freight loss and damage claims paid by the railroads of the United States during 1931 totaled $25,868,485, as compared with $36,239,640 during 1930, a decrease of $10,371,155, or 28.6 per cent, according to final figures compiled by the Freight Claim Division of the American Railway Association. The amount paid in 1931 is the lowest since the federal control period in 1918, and is nearly $10,000,000 less than the last year of private control in 1917, at which time the account totaled $35,079,757. Annual total claim payments since 1917 are as follows:

1917.....	$35,079,757	1924.....	$45,975,675
1918.....	$55,852,797	1925.....	$36,915,439
1919.....	$104,587,174	1926.....	$35,784,779
1920.....	$119,833,127	1927.....	$37,146,813
1921.....	$92,276,319	1928.....	$35,202,251
1922.....	$48,084,955	1929.....	$36,113,903
1923.....	$47,479,195	1930.....	$36,239,640
		1931.....	$25,868,485

An analysis of the causes, shows loss and damage due to rough handling decreased 28.4 per cent, and for unlocated damage 19.4 per cent. The greatest percentage reduction was that in claims due to improper handling, loading, etc., claims on which were reduced from $609,446 in 1930 to $266,214, or 56.3 per cent. During 1931 only one classification showed an increase in claim payments, that being robbery of entire package, which increased from $664,532 in 1930 to $678,407 in 1931, or 2.1 per cent.

Club Meetings

The Railway Club of Pittsburgh (Pa.) will hold its next meeting at the Fort Pitt Hotel, Pittsburgh, on Thursday evening, March 24. Samuel O. Dunn, editor of the *Railway Age*, will speak on The Present Railway Situation.

The Eastern Car Foremen's Association will hold its next meeting on Friday evening, March 25, at 29 West Thirty-Ninth street, New York City. Air conditioning of passenger cars will be the subject of a paper by I. C. Baker, of the York Ice Machinery Corporation.

Flat Rate Taxi Service for Erie Patrons

The Erie has arranged with the Parmelee Transportation Company to provide taxicab service in New York at fixed rates in connection with travel between New York and Middletown, N. Y., and points west. Railway tickets sold between these points will carry coupons entitling the passenger to carriage between Jersey City to all parts of Manhattan south of 110th Street and to the Brooklyn business district by taxicab for 85 cents. The price for children, when accompanied, is 45 cents.

When the Erie started the Erie Limited between New York and Chicago about three years ago, the company considered furnishing train-connection motor coach transportation between its Jersey City

terminal and Manhattan, but did not carry out the project.

Indictments for Violation of Elkins Act

A federal grand jury at Cleveland, Ohio, on March 11 returned indictments against the New York Central, the New York, Chicago & St. Louis, and the Hupp Motor Car Corporation for alleged violation of the Elkins act. The motor company is said to have ordered 40-ft. cars and then made false notations in shipping orders that 36-ft. cars had been ordered thereby obtaining transportation of automobiles based on the minimum weight of 10,000 lb. applicable to 36-ft. cars instead of the 11,200 lb. applicable to 40-ft. cars.

Emergency Wages Board Appointed

President Hoover on March 11 appointed an emergency board to investigate a dispute between the Louisiana & Arkansas and the Louisiana, Arkansas & Texas and their employees, which, he had been notified by the Board of Mediation, threatened to interrupt interstate commerce. The board consists of Walter P Stacy, chief justice of the supreme court of North Carolina; Dr. Davis R. Dewey, head of the department of economics of the Massachusetts Institute of Technology; and Julian H. Moore, chief justice of the supreme court of Colorado.

I.C.C. Consents to Revision of Parcel Post Rates

The Interstate Commerce Commission has given its consent to a revision of parcel post rates proposed by the Postmaster General in an application filed in November, 1930, including both increases and reductions, which the department estimates will increase its revenues by $7,550,000 as a partial offset to its estimated deficit of $15,000,000 in this branch of its service. Vigorous objection to the increases proposed was made by the National Industrial Traffic League and other organizations of shippers; and the Railway Express Agency, opposed the reductions, which are largely in the long-haul rates, as being in competition with its service. Excluding local delivery rates, in which no change is proposed, the total number of rates on all parcels from 1 to 70 lb. to all eight zones is 560, the commission said. No change would result in 7 rates, or 1.2 per cent of the total. Increases would result in 223 rates, or 40 per cent, and reduction in 330 rates, or 58.8 per cent. The increases would apply, however, to the rates that apply to the greater portion of the traffic, that is, on parcels that weigh up to 10 lb. and move to the first three zones; and it was estimated that the new scale as a whole is approximately 5 per cent higher than the present scale. The commission said it was doubtful whether the increased business from the longer hauls would greatly offset the probable loss of business from the shorter hauls, but that it was the judgment of the experienced men of the department that the increased revenue from the higher rates will amply compensate for whatever loss of traffic may occur.

C. N. R. Cuts Expense Allowances

The Canadian National has inaugurated a system for controlling traveling, hotel and other expenses of its officers which constitutes a check on these disbursements. Salary reductions and lay-offs arranged for in the interests of economy will effect a saving of approximately two and a quarter millions a year. A resolution providing a life annuity to Sir Henry Thornton, president, of $30,000 if at any time he should retire from active management of the railway, has been rescinded. Payment of fees to officers of the Canadian National by subsidiary companies, has been discontinued.

This was the information presented to the Parliamentary committee of railways and shipping at Ottawa last week by R. B. Hanson, chairman of the committee. This document, signed by seven members of the board of directors of the railway, was a reply to recommendations for economy made by the committee on railways and shipping at the last session of Parliament. The parliamentary committee recommended a review of all salaries of officers above $5,000. It objected to certain features of traveling and other expenses previously allowed and to the retirement provision for Sir Henry.

The document emphasized that economies of an appreciable nature have been made.

"We are able to report that various economies and savings have been effected which have resulted in a total saving of $28,106,681 as compared with the figures of 1930 of which total $13,064,300 has been reflected in the operations of 1931 and the balance, $15,042,281, will be reflected in 1932," it reads.

"This has been accomplished by the co-operation of the officers of the company, and by many changes in the various departments and services of the company. In addition, retirements and dismissals have taken place, resulting of necessity in regrettable hardship, but in view of greatly reduced revenues such action became necessary, and we deemed it our duty to support the work and efforts of the management in this connection."

Charge For Second Passenger In Sleeping Cars Found Not Justified

With four commissioners dissenting, the Interstate Commerce Commission has issued a report finding not justified the proposal of the Pullman Company, the Chicago, Milwaukee, St. Paul & Pacific, the Minneapolis, St. Paul & Sault Ste. Marie, the Canadian National and the Duluth, Winnipeg & Pacific to establish a charge for a second passenger, where two passengers occupy the same berth in sleeping cars, equal to 20 per cent of the lower berth fare. It had been estimated that under ordinary traffic conditions such a charge would yield the Pullman Company about $750,000 a year increased revenue. The principal objection stated was that no evidence had been offered to justify the increased revenue from the Pullman surcharge accruing to the railroads that would result from the new charge.

Commissioner Mahaffie, in a dissenting opinion in which he was joined by Commissioners Meyer, McManamy and Brainerd, said that the proposed charge should have been found justified, and that no evidence was presented in opposition to either the proposed sleeping car fares or to any increase in the surcharge. He further pointed out that the commission is "charged with the duty to try to maintain an adequate transportation service for the nation" and that "that necessitates adequate revenue. The revenues are now grossly inadequate. The transportation system we are in part responsible for is threatened as never before. Yet here, by highly technical reasoning, we reject tariffs intended to institute reasonable charges for services now performed without charge. Obviously any proper method, as here presented, of reducing losses in passenger operations should have our approval. The need of additional revenue has increased since our decision in *The Fifteen Per Cent Case.*"

Annual Report of Bureau of Explosives

Colonel B. W. Dunn, chief inspector of the Bureau for the Safe Transportation of Explosives, etc., has issued his annual report for the year 1931. Considering explosives only, the report shows no persons killed, none injured and property loss of only $113. Amplifying the statement to include other dangerous articles—acids, corrosive liquids, gasoline, etc., there was a total of 776 accidents during the year, but there were no persons killed and only 20 injured; property loss $300,271.

The usual elaborate tables are given showing losses, casualties and classification of causes, for 13 years.

The regulations of the bureau have been modified so as to allow the use of fiberboard boxes for the shipment of dynamite and other high explosives. No shipments have yet been made under this permissive regulation, but the bureau has arranged to watch carefully the result of the change. One duty of the bureau at the present time is to guard against the use of improper placards on cards and neglect to use a placard where one is needed.

Those accidents causing fires, personal injuries or property loss are tabulated in a list covering 21 years, 1910-1930 inclusive, supplemented by a similar statement for 1931. No less than 199 different articles appear in this table, and 78 of them figured in the records of 1931. The more important items (in the order of the number of cases) are gasoline, sulphuric acid, hydrochloric acid, batteries, alcohol, matches, nitric acid and crude petroleum. Twelve fires occurring in the transportation of gasoline, 15 with charcoal and 33 with matches, are set forth in more detailed lists.

The report contains all of the illustrated educational bulletins which have been issued during the year; these fill 30 pages.

The membership of the bureau includes

465 companies, operating 307,757 miles of railroad; and numerous manufacturers figure as associate members. The bureau now has 30 inspectors and the personnel of the chemical laboratory numbers four. Freight station inspections totaled 7,379; lectures to railroad employees 365; and 472 cars of explosives in transit were inspected. Of those cars, 10 showed serious violations of regulations.

Hearing on Oregon Electric Extension

A hearing on the application of the Oregon Electric to construct an extension 7½ miles from its Forest Grove, Ore., terminus to the mill site of the Stimson Lumber Company, 2½ miles west of Segher station, was held before H. C. Davis, chief examiner of the finance department of the Interstate Commerce Commission at Portland on March 11. The Southern Pacific opposed the granting of the permit on the grounds that the extension would parallel its present Forest Grove branch for five miles, and would provide an unnecessary duplication of services. W. E. Coman, vice-president of the Northern Pacific, one of the parent companies of the Oregon Electric, testified that the northern lines have invested $1,000,000 in the Spokane, Portland & Seattle to gain an entrance into Portland and the valleys of western Oregon. For many years the northern lines secured a large portion of their traffic from the lumber regions of western Washington, but this traffic is decreasing, while Oregon offers greater opportunities. Mr. Coman estimated that more than 2,000,000 ft. of timber would eventually move through the Stimson mill and over the railway line that served it.

J. H. Dyer, vice-president of the Southern Pacific stated that branch lines on the Southern Pacific were losing money, that lumber car loadings on the entire system had decreased alarmingly during the last two years and that western Oregon already has more railroads than it can support. He further contended that the parent companies of the Oregon Electric would not be shut out of the traffic originating in the Stimson operations, for they have traffic exchange facilities available in Portland. The Southern Pacific, he said, has already started the construction of a spur track from Segher station to the mill site, and now is nearly ready to serve the timber operations as well as the applicant could.

No Peace River-Pacific Railway Now

Inhabitants of the Peace river district in Northern Alberta, who for more than fifteen years have been pressing for a direct railway outlet to the Pacific Coast and whose demands are heard through members in the House of Commons at Ottawa every session were heard from once more on March 14 when Donald M. Kennedy, Progressive member for Peace River, again moved his resolution calling for immediate commencement of that project. Hon. Robert J. Manion, Minister of Railways and Canals, said the two railways, Canadian Pacific and Canadian National, did not desire to build this road now and that the government in the present state of the treasury could not think of building it.

Dr. Manion quoted from an engineering report the following conclusions:

> At the time the 1925 report was made, local interests were mainly concerned in obtaining a western outlet to cheapen their freight cost to the Pacific, and supply further railway mileage in the district. Since that time, a reduction of freight rates has been accorded them, now substantially equalling rates which would obtain if a western outlet were in use; and also since that time, about 130 miles of new branch lines have been put into operation. Thus, if not all, have the main requirements of the local interest been met. As the development of the district is from time to time pushed beyond reasonable road haulage distance from the existing lines of railways, local interest will demand further railway mileage. In our opinion this can be, as and when necessary, readily met by further branch line construction.
>
> In view of the above, our conclusions are:
>
> 1. No western outlet is justified for the present, as the existing railway furnishes the most economical route. It will take many times the present traffic to justify another railway outlet.
> 2. The Obed route for a western outlet is the most favourable from a railway economic standpoint, considering the present phase of the railway situation.
> 3. We recommend that the matter of a final route be decided when the question is a practical one, believing that by the time the volume of traffic has reached a point where a western outlet is justified, general and possible local conditions may have materially changed. When the decision is imperative, the whole situation should be reviewed, in order to appraise all the contributing factors, including the potential traffic which may accrue from the lands beyond the definite areas included in this report.

This is signed by the three engineers, Mr. J. M. R. Fairbairn, chief engineer of the Canadian Pacific; C. S. Gzowski, chief engineer of construction of the Canadian National; and C. R. Crysdale, consulting engineer.

Equipment and Supplies

FREIGHT CARS

THE ALASKA RAILROAD inquiry for 10 Hart convertible ballast cars which was reported in the *Railway Age* of December 5, was withdrawn because the company later decided to construct coal bunker facilities at Seward, Alaska. The company is now sending out new invitations for bids on a car which can be used both for handling coal to be dumped through hopper bottom and in ballast service.

IRON & STEEL

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon, March 31, covering steel bars, steel shapes, steel plates, etc., for its second quarter requirements.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC, which was reported in the *Railway Age* of February 27 as expecting to enter the market for 16,000 tons of rails is now ordering small amounts from time to time from the Illinois Steel Company and the Inland Steel Company.

MOTOR VEHICLES

NEW YORK, NEW HAVEN & HARTFORD has purchased through the Massachusetts Motor Car Company, five Dodge two-ton heavy duty tractors.

Supply Trade

The National Lumber Manufacturers Association has moved its general offices in Washington, D. C., from 702 Transportation building to 1337 Connecticut avenue.

W. R. England of the St. Louis office of the **Truscon Steel Company,** Youngstown, Ohio, has been appointed assistant manager, railroad department, southwestern district, with headquarters at 1005 St. Louis Mart Building, St. Louis, Mo.

The Gregg Company, Ltd., has moved its sales and export office, located for the past ten years at 67 Wall Street, to larger quarters at 19 Rector street, New York City. This company has car building plants at Hackensack, N. J., and Loth, Belgium.

G. B. Allison, 50 Church street, N. Y. has been appointed representative of the **J. I. Holcomb Manufacturing Company,** to handle the sale of its cleaning brushes and chemicals in the eastern railroad field. Mr. Allison is also representing the Excel Curtain Company.

H. E. Graham, assistant vice-president of the American Car & Foundry Company, New York, has resigned effective April 1, and has been appointed assistant to president and general traffic manager of the **Jones & Laughlin Steel Corporation,** Pittsburgh, Pa., to succeed F. A. Ogden, deceased.

Guy H. Billings has been appointed assistant general manager of the **Four Wheel Drive Auto Company,** Clintonville, Va., manufacturer of FWD trucks. Mr. Billings, who has been with the company for nineteen years, has served during the past seventeen years as purchasing agent, which title he will also retain in his new position.

The General American Tank Car Corporation has merged its Canadian interests with the **Canadian Tank Car Company, Ltd.,** a subsidiary of **Canadian Car & Foundry Company, Ltd.,** and the new company will be known as the **Canadian General Transit Company, Ltd.,** with headquarters at Montreal, Que. Control will be retained by Canadian Car & Foundry Company, Ltd.

Frank L. Fay was elected president of the **Greenville Steel Car Company,** Greenville, Pa., at the annual meeting of the stockholders, succeeding **F. D. Foote,** who has resigned and will devote his time principally to the Pittsburgh Forgings Company, of which he was recently elected president. Mr. Fay is the founder of the Greenville Steel Car Company and served as its president until 1925, when he became chairman of the board of directors and Mr. Foote became president.

At a meeting of the **Locomotive Crane Manufacturers Association** held recently in Chicago, a resolution was adopted against the members taking in

Continued on Next Left Hand Page

LIGHT TRAFFIC OR HEAVY

SUPER-POWER PAYS

Low costs follow the Super-Power Locomotive

« Roads making the best showing in these days of reduced traffic are those where Super-Power is at work « With falling traffic, roads which have recently purchased Lima Super-Power locomotives have a distinct advantage « Now is the time to be working on new power for use when improved business calls for more locomotives.

LIMA LOCOMOTIVE WORKS • Incorporated • LIMA • OHIO

used equipment in the sale of other used or new equipment. The resolution adopted was as follows: "We each agree that the firm we represent will not receive any used crane, shovel ditcher or other used equipment in part or entire payment for any new or used fully revolving rail crane, shovel or ditcher sold by it. Further, the firms we represent will not finance or assist directly or indirectly in the financing, or assist otherwise in the disposal of such used equipment in making sale of fully revolving rail crane, shovel or ditcher. Further, the firms we represent will so far as in their power stop any of their agents or distributors from assisting in the disposal of used cranes, shovels or ditchers in furtherance of the sale of new fully revolving rail cranes, shovels or ditchers. This agreement shall be and is in effect on and after February 1, 1932, and for one year from that date."

Irvin Succeeds Farrell as President of U. S. Steel Corporation

William A. Irvin, who will succeed to the presidency of the United States Steel Corporation on the retirement of James A. Farrell, on April 19, has been actively identified with the manufacture of sheets and tin plate and also with the iron and steel industry for the past 36 years. Mr. Irvin was born on December 7, 1873, at Indiana, Pa., and was educated in the public schools and the night courses of the Indiana State Normal School. In 1888, he entered the employ of the Pennsylvania Railroad as a telegraph operator and later became clerk and assistant freight and ticket agent. In 1895, he went with the P. H. Lauf-

William A. Irvin

mann Company, Ltd., Apollo, Pa., serving as shipping clerk; later he held various positions until he became superintendent. When this company was taken over in 1900 by the American Sheet Steel Company, Mr. Irvin was transferred to the general offices at New York, and in 1904, when the American Sheet Steel Company was merged into the American Sheet & Tin Plate Company, he went to Pittsburgh as assistant to the operating vice-president of the new company, which position he held for about 20 years. He then served as vice-president in charge of plant operations with headquarters at Pittsburgh, until September, 1931, when he was elected a vice-president of the United States Steel Corporation.

James A. Farrell, who will retire on April 19 from the presidency of the United States Steel Corporation was born at New Haven, Conn., on February 15, 1863. Mr. Farrell has been connected with the iron and steel industry since he was 16 when he began work with the New Haven Wire Company, New Haven. In 1888, he served in the mills of the Pittsburgh Wire Company and later became superintendent and manager. He subsequently served as general superintendent of the Oliver Steel Wire Company, then as general manager of the Oliver Iron & Steel Company. Mr. Farrell took part in the organization of the Pittsburgh Wire Company, Braddock, Pa.; this company later became part of the American Steel

James A. Farrell

& Wire Company, of which Mr. Farrell was general manager of exports until 1903. The large increase in the exports of the American Steel & Wire Company led to Mr. Farrell's being given supervision over the export sales of all of the other manufacturing companies of the United States Steel Corporation, and to the formation in the latter part of 1903 of the United States Steel Products Export Company, New York, of which he became president. The name of this company was changed in 1910 to the United States Steel Products Company. Mr. Farrell left that company in January, 1911, to become president of the United States Steel Corporation. Mr. Farrell is also a director of the American Bridge Company, Federal Steel Company and Tennessee Coal, Iron & Railroad Company. He is a member of a number of technical organizations including the American Iron & Steel Institute and served as chairman of the National Foreign Trade Council.

American Steel Foundries

The annual report of the American Steel Foundries for 1931 shows an operating loss of $791,373, as compared with a net income of $2,801,442 in 1930. The surplus account, which, on December 31, 1930, amounted to $13,427,378, was reduced to $10,765,835 after charging the operating loss of $791,373, the loss from property sold and plant dismantled amounting to $146,178, premiums on preferred stock and treasury and the preferred stock sinking fund amounting to $39,246, preferred stock dividends amounting to $443,450 and common stock dividends amounting to $1,241,275.

The consolidated income account, with comparisons with 1930, follows:

	1931		1930
Earnings from operations, after deducting Manufacturing, Selling and Administrative Expense, but before provision for Depreciation, Federal Taxes	$8,595		$3,921,874
Deduct Depreciation	978,020		1,187,975
Loss from Operations	$969,425	(Profit)	$2,733,899
Miscellaneous Income:			
Interest, Discount and Exchange	$33,741		$95,684
Income from Investments	301,971		303,833
Less — Miscellaneous Charges to Income	146,637		.....
Total	$780,350	(Profit)	$3,133,416
Reserve for federal income tax	.....		$313,870
Net Earnings of Subsidiary Company appertaining to Outstanding Minority Stockholdings	$11,023		$18,104
Amount Carried to Surplus	$791,373	(Profit)	$2,801,442

George E. Scott, president, in his statement to stockholders said in part, "Taking a long view, your board feels that the outlook for the future of the railroads, who are our principal customers, is more encouraging than it has been for a long time. The basis for this belief is found in the indications that the general public and governmental regulatory bodies see the necessity for allowing the railroads to increase their revenue and to protect their credit so that they will be in a position to improve their properties in a way that will be necessary to care properly for the transportation needs of this country. There are also indications that the shippers realize the need for increased railroad revenue and that thoughtless resistance to reasonable rate increases is on the decline."

Westinghouse Electric & Manufacturing Company

The Westinghouse Electric & Manufacturing Company for the year ending December 31, 1931, reported a loss of $3,655,659 as compared with a net income of $11,881,705 for the year ending December 31, 1930. Total sales billed during the past year amounted to $115,393,082, as compared with 1930 sales of $180,283,579. Unfilled orders as of December 31, 1931, totaled $40,024,390, or approximately the same as at the close of the previous year. The maintenance of unfilled orders at the December 31, 1930 level, the report points out, is due to certain orders for large equipment, notably electric loco-

motives for the Pennsylvania Railroad's electrification project.

The balance sheet at the close of the year showed current assets of $100,522,487 as against current liabilities of $7,368,011. Cash, alone, amounted to $20,585,564, or nearly three times the total current liabilities.

The consolidated income and surplus account for the year 1931 is as follows:

NET SALES		$115,393,082
COST OF SALES:		
Manufacturing cost and all distribution, administration and general expenses—including provision for taxes, service annuities, operating reserves, and depreciation of buildings and equipment		119,931,063
LOSS FROM SALES		$4,537,980
OTHER CHARGES:		
Current operating loss of subsidiary companies not included in consolidation		1,645,381
GROSS LOSS		$6,183,361
LESS INCOME CREDITS:		
Interest, discount and misc. income, net	$1,715,842	
Dividends and interest on investments	1,434,311	3,150,152
NET Loss from ordinary operations for 1931		$3,033,209
PROVISION for decline during the year in valuation of net current assets in foreign countries		622,451
NET Loss after deducting provision for foreign exchange losses		$3,655,660
SURPLUS, January 1, 1931		95,373,912
SURPLUS, before adjustments		$91,718,252
ADJUSTMENTS:		
Revaluation of investments in companies not previously consolidated, and other miscellaneous items	$3,617,374	
Provision for decline in value of securities	2,054,005	5,671,379
SURPLUS, before dividends		$86,046,873
DIVIDENDS:		
On preferred stock	$209,934	
On common stock	6,786,615	6,996,549
SURPLUS, Dec. 31, 1931—including $16,293,860.00 capital surplus representing premium on sale of additional common capital stock in 1929		$79,050,324

NOTE—Provision for plant and equipment depreciation for the year 1931, for all companies included in the above statement amounted to $5,173,914.

American Locomotive Company Annual Report

Net loss of $3,929,384, after providing for depreciation and setting up a reserve for discount on Canadian exchange, has been reported by the American Locomotive Company for the year ending December 31, 1931, as compared with a total net profit, for the fiscal year 1930, of $3,778,558. Selected items from the consolidated income and surplus accounts for the two years are as follows:

	1931	1930
Net profit or loss after deducting manufacturing, maintenance and administrative expenses	*$1,693,425**	$5,334,157
Depreciation on plants and equipment	1,641,971	1,217,409
	$3,335,396	$4,116,748
Reserve for discount on Canadian exchange	593,988	.....
Accrual for Federal taxes	.....	338,190
Profit or loss for the year	*$3,929,384**	$3,778,558
Dividends—Preferred stock	2,619,386	2,695,000
Common stock	767,900	3,465,000
Deficit after dividends	*$7,316,670**	*$2,381,442**

* Loss

Dividends on preferred stock were maintained on the regular $7 basis, the decline in total disbursements on this class of stock in 1931 as compared with 1930 being due to a reduction from 385,000 to 358,998 in the number of shares outstanding. Common stock outstanding was reduced during the year from 770,000 shares to 767,900, but dividends on this class of stock were sharply curtailed, being cut to $1 per share in 1931 and finally discontinued altogether, as compared with payments of $8 per share in 1929 and $4.50 in 1930.

As of December 31, 1931, the combined earned and capital surplus, after deductions for operating loss, dividends, etc., amounted to $20,661,196. This figure compares with a 1930 surplus of $19,759,953, the increase under adverse operating conditions being due to "a surplus adjustment whereby the depreciated value ($21,868,203) of existing additions to permanent plant property—in prior years charged to reserves created out of current earnings—has been added to the cost of property and earned surplus accounts. Also, capital surplus amounting to $14,426,998 has been applied as a reduction of the cost of property account."

The company's cash position continued strong, current assets of $24,491,964 exceeding current liabilities of $1,861,737 by $22,630,227. Cash on hand or in banks alone amounted to $3,618,584, or nearly twice the current liabilities, while cash and marketable securities amounted to $14,829,685.

William H. Woodin, chairman of the board, in his remarks to the stockholders, speaks in part as follows:

> During the year 1931, the productive activity of the plants was at a lower ebb than at any time since the organization of the company. The company shipped only 77 new locomotives. The unfilled orders on the books at January 1, 1932, amounted to $4,621,456, compared with $7,528,725 at January 1, 1931. While the buying of locomotives was practically at a standstill, the subsidiaries, engaged in diversified lines, showed more encouraging results. Alco Products, Inc., booked business during the year amounting to over $3,000,000 and the sale of Diesel engines by McIntosh & Seymour Corporation amounted to over $1,500,000. The program for diversification in these and other lines of industry is steadily moving forward. In addition to the projects outlined in previous annual reports, preparations have been made for the construction of Diesel engines and other diversified products at the Montreal plant.
>
> While it is impossible to make any accurate forecast of the business of the company for the coming year, it is hoped that the general wage reductions effected by the railroads and the activities of the Reconstruction Finance Corporation will tend to restore the purchasing power of the railroads.
>
> The management has effected substantial economies in operation and is continuing to reduce expenses without, however, impairing the operating efficiency of the company.

OBITUARY

William L. Austin, former president and chairman of the board of directors of the Baldwin Locomotive Works, died at his Rosemont, Pa. home on March 10.

John M. Sellers, president of the Sellers Manufacturing Company, Chicago, died at his home in Downers Grove, Ill., a suburb of Chicago on March 13, following a heart attack. He was born at Keokuk, Iowa, on August 12, 1865 and in 1886 entered the employ of Morris Sellers & Co., which was organized in 1878 by his father. After working for

John M. Sellers

this company for six years, he went to the Missabe Iron Range, where in 1893-1894 he discovered and developed the Sellers mine near Hibbing, Minn. In 1895, when the Sellers Manufacturing Company succeeded Morris Sellers & Co., he became vice-president and general manager. In 1915 he was elected president, which position he held until the time of his death.

Construction

MISSOURI PACIFIC.—A contract has been awarded to Edwin Ahlskog, Chicago, for rebuilding the timber section of the work house of the Kansas-Missouri elevator at Kansas City, Mo., recently destroyed by fire. The new work provides for reinforced concrete with modern equipment, including a car dumper. The Missouri Pacific has also applied to the Public Service Commission of Missouri for authority to construct a reinforced concrete and steel subway to replace the present structure of the Laclede station at Maplewood, Mo.

NEW YORK CENTRAL.—The East Henrietta-Rochester county highway grade crossing of this company's tracks, near Ridgeland station, Henrietta, N. Y., has been designated for elimination by the Public Service Commission of New York, by carrying the highway under the grade of the railroad. Proceedings for the elimination of a New York Central grade crossing on the Chili-Coldwater county highway, near Coldwater station, Gates, N. Y., have been closed.

NEW YORK, CHICAGO & ST. LOUIS.—A contract has been awarded the Walsh Construction Company for grading work incident to the extension of a yard at 103rd St., Chicago.

Continued on Next Left Hand Page

FRANKLIN TYPE "E" P

A unique design providing:

1. Maximum holding power with
2. Provision for lubrication as well as
3. Automatic indication of piston packing cup condition, thus
4. Avoiding disassembly of the gear to check the packing.

DESIGN DETAILS

A balanced slide valve is used. Every air man is familiar with this type and understands the little maintenance required.

Crossheads and guides are eliminated, thus reducing weight, number of parts for stock, and over-all maintenance.

The piston trunk and front head are proportioned to care for all side and vertical stresses at low unit bearing pressures. The self-adjusting piston rod packing requires no attention between shoppings.

The seal between the Rocker Arm and the Valve Chest is accomplished by a metallic joint. This is an advantage over soft packing.

FRANKLIN RAILWAY SUPPLY

"POWER REVERSE GEAR

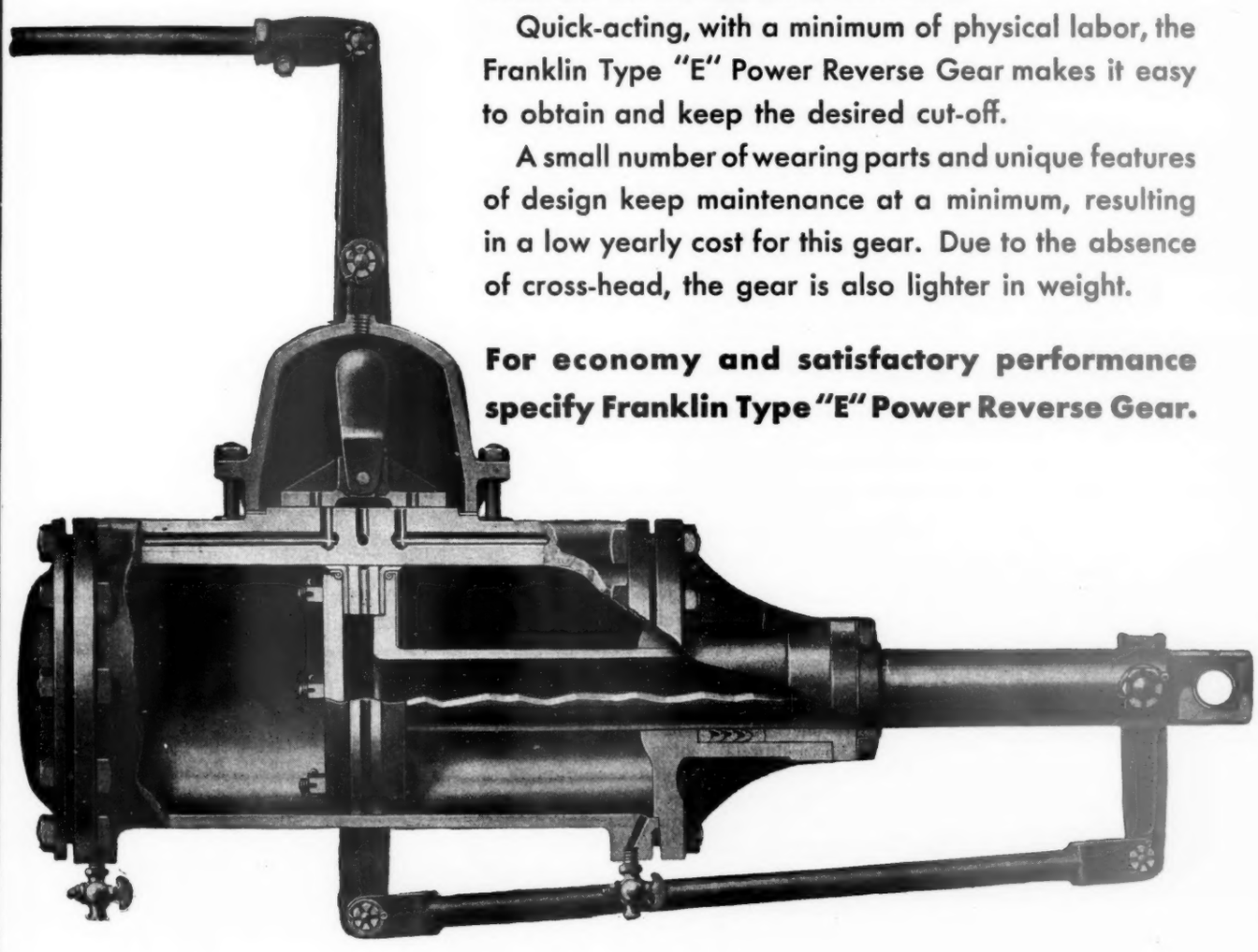
- accurate control; quick response
- low maintenance
- proved performance

Proved by performance on thousands of locomotives, the Franklin Type "E" Power Reverse Gear gives accurate cut-off control at low cost.

Quick-acting, with a minimum of physical labor, the Franklin Type "E" Power Reverse Gear makes it easy to obtain and keep the desired cut-off.

A small number of wearing parts and unique features of design keep maintenance at a minimum, resulting in a low yearly cost for this gear. Due to the absence of cross-head, the gear is also lighter in weight.

For economy and satisfactory performance specify Franklin Type "E" Power Reverse Gear.



Y COMPANY, INC., NEW YORK, CHICAGO, MONTREAL

Financial

ALABAMA CENTRAL.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $25,000 to meet maturing indebtedness.

ANN ARBOR.—*R. F. C. Loan.*—The receivers have applied to the Reconstruction Finance Corporation for a loan of $764,657 for interest and bills for materials and supplies.

ATLANTIC CITY.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Stone Harbor, which has a line from Cape May Court House to Stone Harbor, N. J., 3.9 miles, by purchase of its stock and by an operating agreement.

BALTIMORE & OHIO.—*Passes Preferred Dividend.*—At a meeting of the board of directors of this company on March 16 no action was taken on dividends on either preferred or common stock.

BALTIMORE & OHIO.—*Authorized to Substitute Capital Expenditures.*—The Interstate Commerce Commission has authorized this company to substitute for capital expenditures submitted as a part of the bases for the issue of $41,107,700 of common stock and $63,031,000 of convertible bonds, heretofore authorized by the commission, certain other capital expenditures not heretofore capitalized in the amount of $51,031,165, and to use the proceeds remaining from the sale of the stock and bonds to reimburse its treasury in part for the substituted expenditures. This is on condition that the company shall not, without first receiving permission from the commission, sell, pledge, or otherwise dispose of any portion of its holdings of the stock of the Alton or affiliated companies.

BUFFALO, UNION-CAROLINA.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $100,000 to meet short-term indebtedness.

CANADIAN PACIFIC.—*Operating Results in 1931.*—Following a meeting of the board of directors of this company in Montreal on Monday, there was issued the preliminary statement of earnings, expenses and interest and dividend disbursements for 1931.

Gross revenues from railway and lake steamers for the past year amounted to $142,337,648, as compared with $180,900,804 in 1930. Operating expenses amounted to $116,654,776, against $142,652,146 in 1930, which left net earnings for 1931 at $25,682,872, contrasted with $38,248,658 in 1930. Special income for 1931 is shown in the statement at $10,951,964, against $20,042,923 in the preceding year, when there was included a proportion of a special distribution from Allan Steamship Company at $7,031,939. This made a total income for 1931 of $36,634,836.

Special income for the year was made up as follows: Net revenue from investments and available resources, $3,191,589; interest on deposits and interests and dividends on other securities, and results of separately operated properties, $5,648,600; net earnings ocean and coastal lines, $487,517; and net earnings commercial telegraph and news departments, hotels, rentals and miscellaneous, $1,624,258.

The operating results shown in the statement include the Kettle Valley from January 1, 1931, and those of the Algoma Eastern Railway, the Fredericton & Grand Lake Coal Railway and the New Brunswick Coal & Railway from July 1, 1931.

	1931	1930
Gross revenues	$142,337,648	$180,900,804
Operating expenses	116,654,776	142,652,146
Net revenues	25,682,872	38,248,658
Special income	10,951,964	20,042,923
Gross income	36,634,836	58,291,581
Fixed charges	22,050,364	19,159,865
Surplus	14,584,472	39,131,716
Pension fund	750,000	750,000
Net income	13,834,472	38,381,716
Preferred dividends	5,410,697	5,005,623
Balance	8,423,775	33,376,093
Ordinary dividends	16,750,000	33,242,907
Net surplus	d 8,326,225	133,186

d-Net debit chargeable to surplus.

CHESAPEAKE & OHIO.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue such an amount of $28,142,000 of refunding and improvement mortgage 4½ per cent gold bonds, heretofore authenticated, as may be necessary for pledge as collateral for $9,000,000 of short-term notes. The authority is granted, however, on the express condition that no portion of the bonds shall be pledged as security for any notes issued in respect of the purchase of or payment for any stock of any other company or any evidence of indebtedness of "any other company or of any persons, partnership or association," unless such pledge is hereafter specifically authorized by the commission.

CHICAGO & EASTERN ILLINOIS.—*R. F. C. Loan.*—The Interstate Commerce Commission, on March 15, approved an additional loan of $82,080 to this company from the Reconstruction Finance Corporation, to enable it to pay six months' interest, due April 1, on its first consolidated mortgage bonds. The company had previously received a loan of $3,629,500 to meet obligations maturing March 1. The additional loan is secured by an order on the Railroad Credit Corporation.

CHICAGO & NORTH WESTERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority for the abandonment of a line from Mattoon to Mattoon Junction, Wis., 9.13 miles

COWLITZ, CHEHALIS & CASCADE.—*Receivership.*—By order of the Superior Court of Lewis County, Wash., M. B. McBride, vice-president, auditor and assistant treasurer of this company, was on March 7 appointed its receiver.

DAYTON-GOOSE CREEK.—*Tentative Recapture Report.*—The Interstate Commerce Commission has issued a tentative recapture report finding that this company in the years 1920 to 1926 earned $874,837 in excess of 6 per cent on its valuation and ordering it to pay $254,291 as the unpaid balance of half the amount by April 20 unless a protest is filed. This is the company which ten years ago precipitated a decision of the Supreme Court of the United States sustaining the constitutionality of the recapture provisions of the transportation act by going to court in an effort to enjoin the commission from recapturing any of its earning when the commission issued its first general circular to the railroads directing them to report the amount of their excess earnings and to remit half the amount if any. The commission at that time took the position that it had made no direct demand for any amount and that its circular was in the nature of a "warning," but the company has paid about $173,000 into the recapture fund. The road has since been acquired by the Southern Pacific.

DENVER & RIO GRANDE WESTERN.—*Acquisition.* — The Interstate Commerce Commission has granted this company an extension of time until June 15 within which to comply with the conditions under which the commission authorized it to acquire control of the Denver & Salt Lake by commencing construction on the Dotsero cut-off in Colorado, through the Denver & Salt Lake Western, and by acquiring minority stock of the Denver & Salt Lake. The company had asked the commission for an extension of time until April 15, 1933, saying it had been unable to provide the funds necessary. This was opposed at an argument before the commission last week by the Denver & Salt Lake, the Moffat Tunnel Commission, the Moffat Improvement District and the Uintah Basin League, who desired that work on the cut-off be started as soon as possible, and suggestion was made that the company might obtain a loan from the Reconstruction Finance Corporation.

FLORIDA EAST COAST.—*R. F. C. Loan.*—The receivers have applied to the Reconstruction Finance Corporation for a loan of $918,375 to provide for maturing equipment trust certificates and interest.

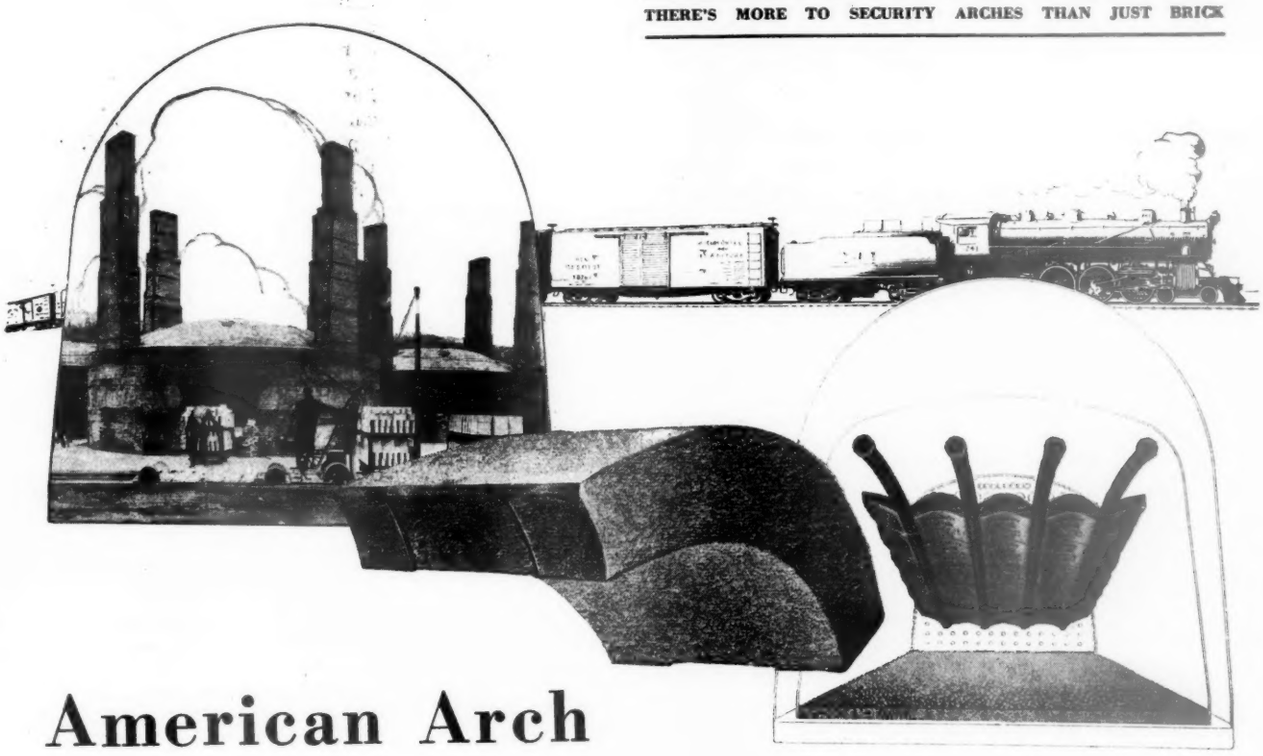
FORT SMITH & WESTERN.—*R.F.C. Loan.*—The Interstate Commerce Commission on March 11 approved a loan of $162,000 from the Reconstruction Finance Corporation to the receiver of this property, to provide funds to pay overdue bills, taxes and bank loans, but reserving consideration on the balance of an application for $250,000 including an estimate for the deficit for 1932.

GULF & SHIP ISLAND.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $694,350 to meet interest, taxes and sinking fund payments.

GULF, MOBILE & NORTHERN.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $770,000 to provide for interest requirements, terminal improvements at New Orleans to the amount of $150,000, and additions and betterments to the amount of $100,000.

Continued on Next Left Hand Page

THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK



American Arch Company Combines The Elements That Make A Satisfactory Arch

GOOD Arch Brick coupled with sound design and competent service go to make a satisfactory locomotive arch.

American Arch Company combines all three elements.

Arch Brick is furnished by the following strategically located manufacturers possessed of high-grade clay deposits and well experienced in brick making.

HARBISON-WALKER REFRACTORIES CO.
Pennsylvania
Ohio
Kentucky
Alabama
Missouri

NORTH AMERICAN REFRACTORIES CO.
Pennsylvania
Kentucky

IRONTON FIRE BRICK CO.
Ohio

DENVER SEWER PIPE & CLAY CO.
Colorado

ATHENS BRICK & TILE CO.
Texas

MOULDING-BROWNELL CORP.
Ohio

GLADDING-McBEAN & CO.
California
Washington

DIAMOND FIRE BRICK CO.
Colorado

DOMINION FIRE BRICK & CLAY PRODUCTS, LTD.
Saskatchewan, Canada

CANADA FIRE BRICK CO. LTD.
Ontario, Canada
Quebec, Canada

AMERICAN ARCH CO.

Incorporated

NEW YORK • CHICAGO

LOCOMOTIVE COMBUSTION SPECIALISTS

KANSAS CITY, KAW VALLEY & WESTERN.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $135,831 to enable it to meet bond interest, back taxes, and bills for materials and supplies.

LEHIGH VALLEY.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability in respect of $2,078,000 of 5 per cent equipment trust certificates to be delivered to the American Locomotive Company and the Baldwin Locomotive Works in connection with the acquisition of 20 locomotives, 10 per cent of the purchase price being paid in cash.

MAINE CENTRAL.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $2,400,000 to enable it to pay maturing notes.

MISSISSIPPI EXPORT.—*R. F. C. Loan.*—The Interstate Commerce Commission, on March 1, approved a loan of $100,000 from the Reconstruction Finance Corporation to enable this company to pay bank loans, interest and accounts payable, secured by deposit of $100,000 of its first mortgage 6 per cent bonds, a first lien on the carrier's entire property, which had been issued as collateral for a bank loan.

NEW YORK CENTRAL.—*Commercial Value of Boyne City, Gaylord & Alpena.*—The Interstate Commerce Commission has issued a report and order finding the commercial value of the property of the Boyne City, Gaylord & Alpena, a 91-mile line in Michigan, to be $230,000, and requiring the New York Central to offer to acquire the property at that price under one of the conditions imposed when it authorized the lease of the Michigan Central and Big Four. The Central had offered only $1 for the property while the directors had asked $1,077,247. A board of arbitrators had made an award of $1,393,293. The commission had found the value for rate-making purposes as of 1918 to be $1,706,500 but now finds that part of the property, which has been operated at a loss, should be scrapped. Commissioner Mahaffie dissented, saying that the short line had out-lived its usefulness and would prove a burden to any carrier attempting to operate it as part of a large system. Commissioners Eastman, Brainerd and Lee joined in his expression.

PENNSYLVANIA.—*Asks R. F. C. Loan for Electrification Work.*—An application for a loan of $55,000,000 for three years to enable the company to complete its electrification work between New York and Washington by March 1, 1933, and other improvements, was filed with the Reconstruction Finance Corporation and the Interstate Commerce Commission on March 10. It is proposed to expend $47,000,000 on the electrification work, $2,000,000 on improvements at Newark, $9,822,000 on improvements at Philadelphia, $1,500,000 on improvements at Baltimore, and $7,854,044 for miscellaneous work. This makes a total of $68,176,044, of which the company expects to provide itself $13,176,044. The money is desired in instalments of $7,000,000 on May 1, $1,000,000 on June 1, $5,000,000 on July 1, $6,500,000 on August 1, $3,000,000 on October 1, $16,000,000 on November 1, and $16,500,000 on December 1, and the application said that unless the loan is granted soon or definite assurance of its favorable consideration is forthcoming soon it will be necessary to discontinue practically all the work now going on under the program. "The effect of discontinuing this improvement work would be far-reaching among numerous electric, manufacturing, materials and supplies companies and labor and would be a serious factor in accentuating the present unsatisfactory business conditions," the application said. The electrification program includes $110,443,251, of which $60,736,187 has been expended or engaged, involving carrying charges of $2,845,000 for this year, and as the saving in operating expenses to result from the electrification is estimated at $4,618,000 for the first year the company is anxious to get the benefit of it. As collateral for the loan the company offered 300,000 shares of stock of the Pittsburgh, Fort Wayne & Chicago and 362,000 shares of the Pittsburgh, Cincinnati, Chicago & St. Louis, estimating the "fair value" at $125 a share for the Fort Wayne and $85 a share for the Panhandle, a total of $68,270,000.

The application states that in the opinion of the board of directors the company is unable to find means of raising funds for the purpose on reasonable terms through bank channels or from the general public. As far back as last June the company endeavored to find means of raising the money through sale of securities but no market was found for bonds at a reasonable price. Bankers were willing to make loans for 60 or 90 days but not for permanent improvements. To illustrate the lack of market for railroad bonds it was stated that from January 1 to February 20 twenty-nine important insurance companies had purchased $125,856,000 of securities, of which only 1.7 per cent were railroad securities, and from January 1 to February 13 thirty-five mutual savings banks had purchased $41,493,000 of securities including only 0.3 per cent of railroad securities and had sold more railroad securities than they had purchased. As the result of the return of more normal business conditions, the application said, the company would desire to anticipate repayment of the loan.

The large amount of supporting data accompanying the application, which is required by the corporation, included an estimate that the rate increase to be collected by the Pennsylvania and turned over to the Railroad Credit Corporation would amount to $12,211,000, but it was stated that the Pennsylvania had no intention of applying to that corporation for a loan and an estimate of its earnings for 1932 indicated that it would more than cover its interest requirements. It was stated that the company has on file with the commission data to support issues of securities to the amount of $408,000,000 covering property not yet capitalized and that the net income for the ten years ended with 1930 had averaged 9.49 per cent on the company's stock.

Operating revenues for 1932 are estimated at $399,400,000, as compared with $448,090,279 in 1931, and operating expenses are estimated at $295,600,000 as compared with $352,865,931 last year. The net income is estimated at $21,745,000 as compared with $19,941,499 in 1932 and, after including no estimate for dividends, the income balance is estimated at $15,746,000 as compared with $14,020,107 in 1931 after payment of dividends. In another estimate of the cash requirements for 1932 by months, the company set up the amount that would be required to pay dividends at the present rate of 4 per cent, $6,585,000 in May, August and November and $2,200,000 as the proportion for December.

The company had no loans or bills payable on December 31.

READING.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to sell at competitive bidding an issue of $3,725,000 of equipment trust certificates which the commission has authorized to be sold at par.

ST. LOUIS SOUTHWESTERN.—*I.C.C. Denies Reconsideration of Acquisition Case.*—The Interstate Commerce Commission has denied petitions filed by the Missouri Pacific and Texas & Pacific for a reconsideration of the decision in which the commission conditionally authorized the Southern Pacific to acquire control of the Cotton Belt. It has also overruled a motion of the St. Louis-San Francisco that the Cotton Belt be transferred in the commission's consolidation plan to System No. 19-Rock Island-Frisco.

TENNESSEE & CAROLINA SOUTHERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Maryville, Tenn., to Calderwood, 30.5 miles.

Dividends Declared

Alabama & Vicksburg.—3 per cent, payable April 1 to holders of record March 11.

Vicksburg, Shreveport & Pacific.—Common, 2½ per cent; Preferred, 2½ per cent, both payable April 1 to holders of record March 11.

Average Prices of Stocks and of Bonds

	Mar. 15	Last week	Last year
Average price of 20 representative railway stocks..	28.57	33.11	85.26
Average price of 20 representative railway bonds..	70.15	71.16	93.48

THE ST. LOUIS-SAN FRANCISCO in 1931 established a system record, when its locomotives averaged 521,283 miles run per locomotive failure. The total mileage recorded amounted 18,766,229, while the locomotive failures totaled only 36. During the month of April, there was one locomotive failure and as a result, in this month the miles per failure totaled 1,614,571. During August there were no failures and the mileage totaled 1,560,059.

Railway Officers

EXECUTIVE

Norman Call, vice-president and secretary of the Richmond, Fredricksburg & Potomac, has been elected president of that road succeeding **Eppa Hunton, Jr.,** deceased.

T. E. Bond, who has been elected vice-president in charge of traffic of the Elgin, Joliet & Eastern, with headquarters at Chicago, has had many years experience in railway and industrial traffic work. He was born on November 2, 1876, at Toledo, Ohio, and after a public school education he entered the service of the Denver & Rio Grande in 1902. Four years later he left this road to become assistant traffic manager of the Colorado Fuel & Iron Company at Denver, Col., where he remained for two years, at the end of which time he entered the service of the E. J. & E., as chief tariff clerk. Mr. Bond served successively with this road as chief of the tariff bureau, assistant traffic manager and traffic manager, which latter position he was holding at the time of his recent election as vice-president in charge of traffic. During the World War, Mr. Bond was assistant western traffic manager of the Government Food Administration, and between the time of the close of the war and the return of

T. E. Bond

the railroads to private operation he was assigned to the Western Freight Traffic committee of the United States Railroad Administration. He was appointed traffic manager of the E. J. & E. in 1923.

A. N. Williams Heads C. & W. I. and Chicago Belt

Albert N. Williams, who has been elected president of the Chicago & Western Indiana and the Belt Railway of Chicago, with headquarters at Chicago, has had a railway career of a broad and varied nature. He was born on June 14, 1888, at Denver, Colo., and, after graduating from Yale University, entered railway service in June, 1906, as a rodman on the Denver, Northwestern & Pacific (now part of the Denver & Salt Lake). In September of the same year, he became a machinist's apprentice on the Denver & Rio Grande, and from 1907 to 1910 he was engaged in graduate work at the Sheffield Scientific School of Yale University, re-entering railway service in July, 1910, as a brakeman on the Union Pacific. Later Mr. Williams served this road as a section foreman, extra-gang foreman, timekeeper and inspector of equipment. In 1912, he entered the service of the Missouri-Kansas-Texas of Texas as superintendent, later being appointed trainmaster. In January, 1914, he accepted a similar position on the Chicago, Rock Island & Pacific, returning to the M.-K.-T. as trainmaster two

Albert N. Williams

years later. Mr. Williams left railroad service in March, 1917, to become connected with petroleum interests in this country and Mexico, engaging in this work until May, 1921, when he returned to railway service as assistant general manager of the Midland Valley. Slightly more than a year later he was promoted to general manager, and, in March, 1926, he went with the Soo Line, where he was engaged in special assignments on the staff of the president, with headquarters at Minneapolis, Minn. Early in 1927, Mr. Williams was promoted to general superintendent which position he retained until his recent election as president of the terminal properties at Chicago.

FINANCIAL, LEGAL AND ACCOUNTING

William H. Luckett, newly-appointed general auditor of the Southern, with headquarters at Washington, D. C., was born at Alexandria, Va., on April 3, 1884. Mr. Luckett has been in the continuous service of the Southern since he entered railroad service on August 10, 1899, as a messenger for that road. Subsequently, he served as bookkeeper and clerk, and on July 1, 1913, he was appointed chief clerk to auditor. On February 1, 1917, he became chief clerk to assistant comptroller, and in August, 1918, he was promoted to assistant auditor. On July 23,

William H. Luckett

1928, he became assistant general auditor, the position he held until February 12, 1932, when he was promoted to general auditor.

OPERATING

H. I. Norris, former assistant superintendent of the dining car and hotel department of the Union Pacific, with headquarters at Omaha, Neb., has been transferred to Portland, Ore., as superintendent of the dining car and hotel department at that city, to succeed **Miles M. Lesher,** who has been transferred to Omaha.

Effective March 16, the three operating districts of the Erie—Eastern, Western and New York—have been consolidated into two. The New York district has been merged with the Eastern district, with headquarters at New York, while that portion of the Eastern district between Hornell, N. Y., and Salamanca has been transferred to the Western district, with headquarters at Youngstown, Ohio. **H. J. Bordwell,** general manager of the New York district, at New York, has been appointed to the same position on the enlarged Eastern district, and his jurisdiction extended westward to include the territory Buffalo, Hornell and East. **F. W. Rosser,** general manager of the old Eastern district, with headquarters at Hornell, has been transferred to the Western district, with headquarters at Youngstown, Ohio, succeeding **C. Bucholtz,** resigned. The position of assistant to the general manager of the New York district, with headquarters at Jersey City, which has been held by **C. K. Scott,** has been abolished, Mr. Scott being appointed trainmaster. **H. R. Adams** will continue as assistant general manager with headquarters at Hornell. Other territorial changes include an extension of the jurisdiction of the division officers of the Susquehanna division to embrace the Delaware division; that of the officers of the Wyoming division to include the Jefferson division, and that of the division

(Continued on Second Left Hand Page)

again by---!

WE know of several roads today that are handling all their freight traffic with big wheel modern freight locomotives. Freight is being handled at almost passenger train speeds, and there are cases where these big modern engines are doing 12,000 miles and more per month. These roads today are being operated just about as economically as it is possible to do so.

But, some day traffic will pick up. And orders will come down the line to put in service 25 or 50 of the older engines now in storage. When one of these older engines gets out on the road ahead of one of the modern engines, how long will it be until the modern engine runs up to a red signal? And when the block goes clear the modern engine will only get started good when he will be **"STABBED AGAIN."**

At the end of the month it will be found that the mileage for the modern engines has dropped—they have cost just as much to operate if not more—but the mileage will first drop to 10,000 miles, then 9,000, then probably to 8,000 or less, all depending on how many of the older engines have been put in service.

Certainly, all the engines are hauling their trains, all working fine, and as far as the older engines are concerned they probably will be doing just as well as when they were new—however, the science of railroading has changed materially since these engines were first put in operation.

But, considering the amount of traffic being handled, how much money will the railroad be earning?

We wonder if it is recognized that these older engines, with their lower capacity and greatly reduced operating speed, will more and more every-day tend to bring the earning power of the modern engine nearer and nearer to their own level?

Isn't such a situation, which is almost sure to happen, serious enough to deserve a great deal of thought at present?

MOTIVE COMPANY

NEW YORK CITY

officers of the Allegany and Bradford divisions to include the Meadville division east of Meadville yard and the Buffalo & Southwestern Railroad. The jurisdiction of the division officers of the Mahoning division is extended to include Meadville yard and the Franklin-Oil City, Pa., branch. **H. D. Barber,** superintendent of the Meadville division and the Buffalo & Southwestern, with headquarters at Meadville, Pa., has had his jurisdiction extended to include the Allegany and Bradford divisions, with headquarters at Salamanca, while **T. J. Murphy,** superintendent of the latter two divisions, with headquarters at Salamanca, has been transferred to the Kent division, with headquarters at Marion, Ohio. Mr. Murphy succeeds **H. E. Wilson,** who has been assigned to other duties. **J. D. Rahaley,** superintendent of the Susquehanna and Tioga divisions, at Hornell, has had his jurisdiction extended to include the Delaware division, and **J. W. Graves,** superintendent of the Wyoming division, at Dunmore, Pa., now has jurisdiction over the Jefferson division. G. M. Murray, superintendent of the Delaware and Jefferson divisions, has been appointed assistant superintendent, Susquehanna and Delaware divisions, with headquarters at Susquehanna, Pa.

TRAFFIC

F. W. D. Goddard, who has been appointed general agent of the Virginian, as announced in *Railway Age* of March 5, page 425, will have headquarters at 500 Fifth avenue, New York.

B. F. Parsons, who has been appointed traffic manager of the Chicago Great Western, as noted in the *Railway Age* for March 5, has a record of 31 years' experience in railway traffic work. He was born in 1881 at National City, Cal., and after a public school education he entered railway service on January 1, 1901, as a stenographer in the traffic department of the Chicago & Alton (now the Alton), at Jacksonville, Ill. In July, 1902, Mr. Parsons was transferred to Marshall, Mo., being sent to Chicago several months later, where he became a tariff clerk on January 16, 1906. He became connected with the Chicago Great Western on April 16, 1910, as a tariff clerk at the same point, and on September 1 of that year he was advanced to chief clerk in the general freight office of the Great Western. In 1917, Mr. Parsons was further promoted to assistant general freight agent, which position he held until April 15, 1924, except during federal control of the railroads, when he served as assistant to the federal manager. On that date he was advanced to general freight agent, which position he was holding at the time of his recent appointment as traffic manager, effective March 1.

Thomas L. MacDonald, freight traffic manager, Central region, Canadian National, who retired on March 15, was born at Montreal, Que., in 1871. He began his railroad career with the Grand Trunk (now part of the C. N. R.), in 1887, as an apprentice in the mechanical accounts branch at Montreal. After serving in various clerical positions in the traffic department, he was appointed district freight agent at Hamilton, Ont., in 1903, and later he was transferred to a

Thomas L. MacDonald

similar position at Toronto, Ont. In 1919, he became assistant general freight agent at Montreal. In 1923, Mr. MacDonald was advanced to assistant freight traffic manager at Toronto, and, in 1926, he became freight traffic manager of the Central region, with headquarters at Montreal, the position he held until his retirement.

Oscar C. Stein, who has been appointed general freight agent of the Illinois Central at New Orleans, La., as noted in the *Railway Age* of February 27, has been engaged in railway and commercial traffic work for 30 years. He was born on February 7, 1888, at New Orleans, La., and after a public school

Oscar C. Stein

education entered the service of the Illinois Central at that point, on March 1, 1902, as a messenger in the local freight office. On December 1, 1903, he was appointed tracer clerk in the commercial office at that point, being further advanced to rate and bill of lading clerk two years later. On August 1, 1911, Mr. Stein was promoted to contracting freight agent, which position he retained until the beginning of Federal control of the railroads in 1918. At that time Mr. Stein left railway service to become traffic manager for a wholesale fruit and produce company. He returned to the Illinois Central on November 16, 1920, as city freight agent at New Orleans, being promoted to chief clerk in the general freight department at that point on May 1, 1921. Mr. Stein was further advanced to assistant general freight agent on May 1, 1931, which position he was holding at the time of his promotion to general freight agent, effective on February 20.

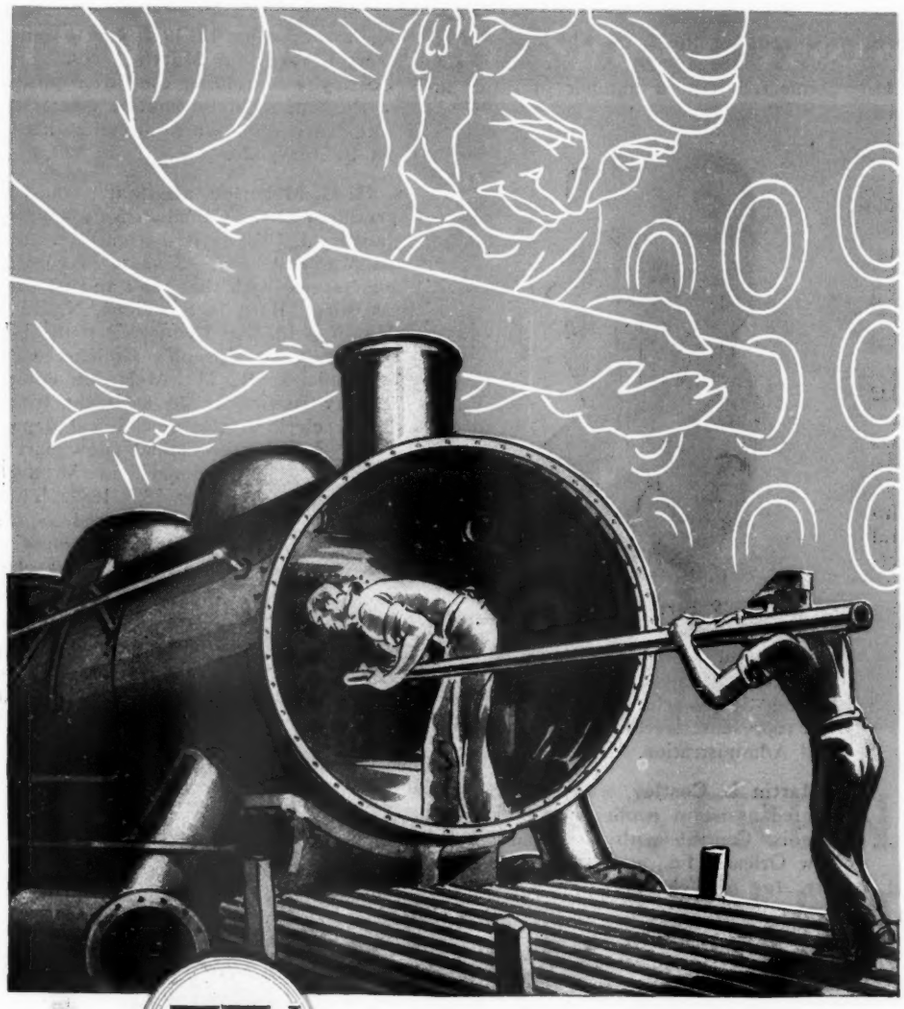
Claude E. Stailey, who has been appointed to the newly-created position of manager of perishable freight traffic of the Illinois Central, as noted in the *Railway Age* of March 5, has served continuously in the traffic department of this road for 26 years. His first railway service was with this road as a stenographer and clerk in the office of the com-

Claude E. Stailey

mercial agent at Kansas City, Mo. On July 21, 1909, he was appointed quotation clerk in the office of the general freight agent at Memphis, Tenn., being promoted to traveling freight agent at Little Rock, Ark., two years later. On May 15, 1914, Mr. Stailey was transferred to Oklahoma City, Okla., and on February 5, 1918, he was advanced to division freight agent at Omaha, Neb., where he served for two years, at the end of which time he returned to Kansas City as commercial agent. Mr. Stailey was further advanced to assistant general freight agent at Memphis a year later. He was transferred to Houston, Tex., on August 1, 1924, and then to Chicago on June 1, 1925. His promotion to general freight agent at the latter point took place on July 16, 1928, and he served in this position until his recent appointment as manager of perishable freight traffic.

John R. MacLeod, who has been appointed general freight agent of the Illinois Central, at Memphis, Tenn., has served with a number of roads during his 24 years of railway traffic work. He

Continued on Next Left Hand Page



WHEN TUBES ARE GIVING TROUBLE ... TRY TONCAN IRON

Boiler tubes are exposed to a variety of attacks. Boiler water eats its way into ordinary tubes unhindered. High temperatures, vibration and fatigue are other boiler tube enemies that shorten tube life. « Now, thanks to modern metallurgy, there is a way to check these attacks. Boiler tubes of Toncan Iron have superior resistance to rust and corrosion. This alloy of refined iron, copper and molybdenum will outlast other boiler tube materials. Service records prove it. « Toncan Iron tubes not only resist corrosion and pitting but they can be cold-worked without danger of subsequent fire-cracking and have high fatigue resistance. « Toncan Iron tubes are a contribution of modern metallurgy to the reduction of locomotive maintenance.

Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Staybolts, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Nitralloy • Agathon Iron for pins and bushings • Agathon Staybolt Iron Climax Steel Staybolts • Upson Bolts and Nuts Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel (20-27 Carbon)

The Bird-boro Steel Foundry & Machine Company of Birdsboro, Penna., has manufactured and is prepared to supply under license, Toncan Copper-Molybdenum Iron castings for locomotives.

TONCAN COPPER Mo-lyb-den-um IRON

REPUBLIC STEEL CORPORATION

HEADQUARTERS: YOUNGSTOWN, OHIO

was born at Blue Springs, Neb., on April 30, 1887, and entered railway service in September, 1908, in the office of the chief of the tariff bureau of the Chicago, Rock Island & Pacific. Three years later he went with the St. Louis-San Francisco as chief clerk to the general eastern freight agent at New York, being sent to Houston, Tex., in the following year. In 1916, when this portion of the Frisco lines became an independent unit, known as the Gulf Coast Lines, Mr. MacLeod was transferred to Baton Rouge, La., as commercial agent. During the World War he served as assistant executive secretary of the Federal Food Board at New York, and in 1922 he returned to railway work in the general freight department of the Kansas City Southern, at Kansas City, Mo. Mr. MacLeod served in various capacities until August, 1926, when he went with the Illinois Central as assistant general freight agent at St. Louis. He was act-

John R. MacLeod

ing in the latter capacity at the time of his recent promotion to general freight agent at Memphis.

Robert D. Reeves, who has been appointed to the newly-created position of assistant traffic manager of the Illinois Central at Memphis, Tenn., was formerly associated with the traffic department of the Illinois Central, but for the last 17 years he has been engaged in outside pursuits. Mr. Reeves was born on December 19, 1877, at Trenton, Ky., and was educated at the Vanderbilt training school at Elkton, Ky. He entered railway service in 1898 as a clerk on the Illinois Central at Louisville, Ky., and was advanced through various positions in the traffic department at that point until 1907, when he went with the Mississippi Central as general freight and passenger agent at Hattiesburg, Miss. Mr. Reeves returned to the Illinois Central as assistant general freight agent at Memphis in 1911, being transferred to New Orleans, La., a year later. In 1915, he left railway service to become connected with W. G. Coyle & Co., Inc., coal operators at Memphis, with which concern he served as vice-president, general manager and a director until his recent appointment as assistant traffic manager for the I. C., which was effective on February 20. Mr. Reeves is also connected with a number of other in-

Robert D. Reeves

dustrial and commercial firms in either an executive capacity or as a director. During the World War he served as port representative for the United States Fuel Administration.

Martin L. Costley, who has been appointed assistant traffic manager of the Illinois Central with headquarters at New Orleans, La., as noted in the *Railway Age* of February 27, was born on September 4, 1881 at New Orleans, and received his higher education at the State University of Louisiana. Mr. Costley entered the service of the Illinois Central at New Orleans on May 1, 1901, as a stenographer, being advanced through the positions of rate clerk and chief rate clerk at that point. He was further promoted to traveling freight agent at New Orleans on January 1, 1908, and on July 1, 1911, he was sent to Brookhaven, Miss., in the same capacity. Four months later Mr. Costley was ap-

Martin L. Costley

pointed chief clerk to the commercial agent at New Orleans, being advanced to chief clerk in the general freight department on February 1, 1912. He was promoted to assistant general freight agent on August 15, 1915, and to general freight agent on March 1, 1920. Mr. Costley was holding the latter position at the time of his promotion to assistant traffic manager, which became effective on February 20.

H. H. Melanson, assistant traffic vice-president of the Canadian National since January 1, 1930, retired from active duty on March 9, after 43 years of continuous service with that road and its predecessors. Born in Scoudouc, N. B., on March 9, 1872, and educated at the University of St. Joseph's College, Memramcook, N. B., Mr. Melanson entered railway service as an assistant to the junior clerk in the mechanical department of the Intercolonial (now part of the Canadian National), at Moncton, N. B., on November 18, 1889. Three years later he was transferred as rate clerk to the passenger department of the Intercolonial, becoming chief clerk

H. H. Melanson

of that department in 1899. After serving for a time as general baggage agent, he was promoted, in 1909, to assistant general passenger agent and, in 1913, to general passenger agent of the same road. In 1917 he was appointed passenger traffic manager of the Canadian Government Railways (now part of the Canadian National), and, in the following year, was appointed to the same position on the Canadian National. In 1923 he was promoted to general passenger traffic manager of the entire C. N. R. system. This position he held until his appointment in 1930 as assistant traffic vice-president, with headquarters at Montreal, Que., which position he was holding at the time of his recent retirement. Mr. Melanson is one of two Canadians to have held the office of president of the American Association of Passenger Traffic Officers, having served as head of this organization in 1929-1930.

ENGINEERING AND SIGNALING

Following the consolidation of the New York districts of the Erie with the Eastern district, I. H. Schram, engineer

Continued on Next Left Hand Page

maintenance of way of the latter district, with headquarters at Hornell, N. Y., has had his jurisdiction extended to include the combined districts, with headquarters at Jersey City, N. J.

MECHANICAL

J. M. Plaskitt, assistant to superintendent of motive power of the Southern, Lines west, has been transferred to serve in that capacity on Lines east.

D. J. Sheehan has been appointed engineer of motive power of the advisory mechanical committee of the Chesapeake & Ohio, the Erie, the New York, Chicago & St. Louis and the Pere Marquette, with headquarters at Cleveland, Ohio, to succeed **S. B. Andrews,** who has resigned. Mr. Sheehan was born at Northampton, Mass., on March 14, 1899, and received his early education in the public schools of that city. He graduated in mechanical engineering from the University of Michigan in 1920, and immediately took up duties as an instructor in the mechanical engineering department of Purdue University, remaining in that capacity until 1923. From that time to 1928, Mr. Sheehan was connected with the engineering department of the Lima Locomotive Works, Lima, Ohio, and then went to the Erie as special engineer to the mechanical assistant to the president. In July, 1929, he was appointed to the same position on the Chesapeake & Ohio, where he remained until his recent appointment.

OBITUARY

William D. Bunker, superintendent of motive power of the Colorado & Wyoming, with headquarters at Pueblo, Colo., died at that place on March 1.

George W. Boschke, chief engineer of the Southern Pacific, Pacific Lines, who died on March 3 of pneumonia, as noted

George W. Boschke

in the *Railway Age* of March 12, had been in charge of many important engineering projects during his professional career of 46 years. He was born on October 10, 1864, at Boston, Mass., and graduated from Wilson College, Wilmington, Cal., in 1886. Later in the same year, Mr. Boschke entered railway service as an assistant engineer on the Southern Pacific, in which capacity he had charge of the construction of the company's lines in Texas and its steamship terminals at Galveston, Tex. In addition, with the permission of the Southern Pacific, he was engaged to take charge of the construction of the seawall at Galveston, following the hurricane and tidal wave disaster of 1900. In 1905, Mr. Boschke was appointed chief engineer of the Oregon Railroad & Navigation Company (then affiliated with the Southern Pacific and now part of the Oregon-Washington Railroad & Navigation Company), at Portland, Ore., and while holding this position he supervised the design and construction of the joint railroad bridge over the Willamette river at that point. He became associated with Twohy Bros., contractors, in 1914, and served with that firm until 1921, when he was appointed assistant chief engineer of the Southern Pacific. In May of the same year, Mr. Boschke was advanced to chief engineer, with headquarters at San Francisco, Cal., which position he held until his death.

Eppa Hunton, Jr., Dies; R. F. & P. President Since 1920

Eppa Hunton, Jr., whose death at the age of 77 years was announced in the *Railway Age* of March 12, had been president of the Richmond, Fredericksburg & Potomac since September, 1920. He rose through the legal department to the chief executive position in the short space of six years, having entered the service of the R. F. & P. in April, 1914.

The eleven-year term of Mr. Hunton's presidency opened upon the depression of 1921 and closed in the midst of the current major economic disturbance; he was thus early initiated into the problem of maintaining net in the face of declining traffic and gross revenues. While R. F. & P. earnings between 1921 and 1931 did not fluctuate within wide range, the largest percentage decline in gross as compared with a previous year being the 14 per cent drop in 1931, considerable skill in expense control was nevertheless required to preserve net income in the face of relatively stable gross on the one hand and rising wages on the other. Beginning in 1921 at $10,002,075 gross revenues reached a peak of $12,891,176 in 1925 and then fell away until in 1931 they were but $8,915,245 or 89 per cent of the 1921 figure. Meanwhile, during this past decade of momentous transport changes and shifts of traffic from rail to highway carriers, the R. F. & P. has been under no illusions as to the menace of the motor vehicle competition. Being a relatively short line operating between two large cities it has been particularly vulnerable to this competition for both passenger and freight traffic. It early met the passenger situation by the inauguration of motor coach services, first through a subsidiary, the operations of which were later turned over to an affiliated company, the Richmond Greyhound Lines. Likewise in the freight traffic field it has been equally alert, having established co-

Eppa Hunton, Jr.

ordinated trucking services and participated in tariffs for the transportation of truck bodies by rail.

Eppa Hunton, Jr., was born in Brentsville, Prince William County, Va., on April 14, 1855. He was educated in private schools at Warrenton, Va., Bellevue High School, Bedford County, Va., and the University of Virginia; from the latter he was graduated in 1877 with an LL.B. degree. In the same year he began his legal career in Warrenton as his father's partner in the firm of Hunton & Son. In 1901 he organized the firm of Mumford, Hunton, Williams & Anderson and in 1914 accepted appointment as general counsel of the R. F. & P. He served in that position (except for the federal control period when he was counsel for the director general) until his election to the presidency in 1920. Mr. Hunton was also president of the Richmond Terminal Railway Company and the R. F. & P. Transportation Company. He served as counsel for the city of Richmond, Va., in procurring the location of the Federal Reserve Bank in that city and was afterward the bank's first general counsel. His political activity included a one-year term as a member of the Virginia Legislature and the chairmanship of the committee on courts of justice at the 1901 Constitutional Convention of Virginia.

A 10 PER CENT REDUCTION in wages on the government-owned Panama Railroad was made effective on March 1, following the general reduction accepted by railway employees in the United States.

RECENT SNOW SLIDES on the west slope of the Cascades near Ritner, Wash., damaged so much railroad property that service was interrupted and both the Chicago, Milwaukee, St. Paul & Pacific and the Great Northern were forced to route their trains over the Northern Pacific. On the Milwaukee, five bridges were destroyed and 5½ miles of track were torn out near Ritner.

RAILWAY AGE

A Defense of the Commission

Chairman Claude R. Porter of the Interstate Commerce Commission delivered an address before the American Railway Engineering Association in Chicago on March 16 which is roughly divisible into two parts, the first consisting of comments upon recent criticisms of the Interstate Commerce Commission, and the second of reasons for the decline of railway traffic, especially during the depression, and suggestions of what seem to Mr. Porter "possible aids in solving the problem" of restoring the earning capacity of the railroads.

Most of the suggestions made by Mr. Porter regarding operating economies, consolidations, authorization of the railroads to engage in all kinds of transportation, equal regulation of all competing carriers, construction and abandonment of lines, and recapture of earnings were economically sound and indicated a desire to be helpful to the railroads. What he said about recent criticisms of the commission was misleading and indicative of unwillingness of the commission to assume its very large share of responsibility for the present railway situation.

Mr. Porter asserted that "all that is said and written along this line about the commission at the present time deals only in glittering generalities and never descends to specific particulars. In all of these onslaughts there is seldom, if ever, named or pointed out the definite thing that the commission has done or failed to do." On the contrary, the policy that the commission has followed, especially under the Transportation act, has been indicted repeatedly in the most specific way by publications and persons who know quite as much about the subject as any member of the commission. These criticisms have not been directed merely against the commission's decision in the 15 per cent rate case, but against specific decisions rendered by it for a decade in carrying out the policy owing to the results of which it is now under fire.

Criticisms That Are Not "Generalities"

In order that Chairman Porter may be better informed we call his attention to the fact that specific decisions of the commission which have been and still are criticized include those regarding the following matters: (1) General reduction of 10 per cent in freight rates in 1922. (2) Application of railways to be allowed to make lower rates to the Pacific coast than to intermediate territory to meet water competition. (3) Proposed advance of 5 per cent in freight rates in western territory. (4) Reduction of freight rates on deciduous fruits under the Hoch-Smith resolution, the decision regarding which was over-ruled by the Supreme court. (5) Valuation of O'Fallon railway, the commission's decision regarding which was, in effect, a decision regarding the valuation of all the railways, and was over-ruled by the Supreme court. (6) Reduction of grain rates, the decision regarding which was over-ruled by the Supreme court. (7) Granting unwarranted so-called "reparations" which have cost the railways many millions of dollars. (8) Revision of class rates reducing rates and revenues on long haul business, and authorizing advances on short haul business by which the railways could not benefit because of truck competition. The significance of the fact that three of the commission's decisions mentioned were over-ruled by the Supreme court cannot be evaded; and as a whole they have been far more than sufficient to account for the failure of the railways to earn the return assured by the Transportation act.

The only constructive step the commission ever took to help the railways earn the return assured them by the Transportation act was that of authorizing a general advance of rates in 1920. Throughout the years 1923-1929 traffic would have borne higher rates, and the commission knew, and repeatedly conceded, that the railways were not earning a fair return. Nevertheless, while it constantly paid lip service to the Transportation act, it as constantly failed to make the readjustments of rates necessary to carry it out. What effects has this policy had on the railways during the depression? First, it prevented them from earning surpluses during the years of prosperity that would have helped them to carry on during the years of adversity. Second, it caused them to enter the depression with a general level of rates which, as it was too low even under prosperous conditions, was bound to prove utterly inadequate if traffic sharply declined.

Five Years Ago—And Now

There is a striking and significant contrast between what the commission said in its opinion in the O'Fallon case in 1927 and what Chairman Porter said in his

recent address. In its opinion in the O'Fallon case the commission said: "As a matter of fact, the railroads have not earned, on the average, the fair return which the rates were designed to produce. * * * Now what have been the results from this state of facts? * * * During the period 1920-1926 the investment in railroad property increased by four billions of dollars. * * * The credit of the railroads in general is now excellent and the time seems to be approaching rapidly when many of them will be able to finance not only through bonds and notes but by issues of new stock. * * * With exceptions in certain sections of the country it will be conceded that the railroads are now in better credit and financial condition, in all probability, than at any time in their history."

These quotations are sufficient to show that in February, 1927, the commission believed that its policy of restricting the railways to less than a fair return, regardless of law, was being vindicated by the practical results, and that it was well pleased with it. The railways entered the depression with approximately the same general level of rates that prevailed at that time. In 1930 they earned only 3.36 per cent upon their property investment, and in 1931, in spite of the most drastic retrenchments ever known, only 2 per cent, with the result that the average earned in the 11 years ending with 1931 was only about 4 per cent, or the lowest ever earned in any equal period since complete railway statistics have been kept. And now, only five years after the commission's O'Fallon decision, we find Chairman Porter saying: "There can be no debate upon the proposition that the railroad carriers of the United States for some time have been and now are confronted with an emergency threatening serious impairment of their financial resources and their capacity to assure the public a continuance of efficient and adequate service". These statements are surely a sufficient commentary on the intelligence, foresight and fairness shown by the commission in what it said in its opinion in the O'Fallon case.

Referring to those who say that "the railways are subject to an overdose of regulation," Chairman Porter said in his address: "With this, of course, the commission has nothing to do. Whatever powers of regulation it possesses were placed there by Congress, whose agent it is." This is "passing the buck" with a vengeance and is entirely misleading. While Congress gives the commission its powers, it is the commission that exercises them. Congress, in the Transportation act, not only empowered but directed the commission to so adjust rates as to enable the railways to earn a fair return. Therefore, insofar as the past and present condition of the railways has been and is due to their failure to earn a fair return, the responsibility for it rests squarely upon the commission and not upon Congress.

How Should Regulation Be Changed?

"What power of regulation contained in the present law would they repeal?", Chairman Porter asked, referring to those who say there is too much regulation. "Would they do away with the power of the commission to prevent discrimination, preferences, and rebates, and preserve equality of treatment among shippers, the foundation stone of the Interstate Commerce act?" Nobody has proposed this, but as Mr. Porter pointed out in his address, the failure of the national and state governments to stop such practices by other carriers is permitting the reestablishment of every form of unfair discrimination in service and rates prohibited by the Act to Regulate Commerce, and thereby enabling other carriers to take vast amounts of traffic from the hamstrung railways. "Would they abolish the control over the issuance of stocks and bonds and return to the days of the high financing of old? Would they repeal the requirement that before a carrier can construct a new line of railway or abandon a line already in operation they must secure the consent of the commission?" As far as we know, nobody has as yet proposed abolition of these forms of regulation, although not infrequently they are very unfairly used.

"Would they take away the authority of the commission when a new rate is proposed which is protested by the shippers, to suspend that rate for seven months and in the meantime require the proponents of the new rate to justify it?" After having observed for twenty-two years the way in which the commission has exercised its power of suspending proposed changes in rates, the *Railway Age* would unhesitatingly answer this question in the affirmative. The commission's record in the exercise of its power to suspend and prevent changes in rates proposed by the railways has been one of almost unbroken incompetency and unfairness, and gives ground for the most serious fear that they will never be able to make adequate earnings until the commission's power is restricted to that of correcting unfair discriminations. A minor illustration that a majority of the members of the commission are still disposed to deny the Pullman Company and the railways almost every reasonable opportunity to increase their revenues was afforded by the decision, reported on page 503 of the *Railway Age* of March 19, refusing to let the Pullman Company make an extra charge of 20 per cent of the lower berth rate when two passengers occupy a berth. Commissioner Mahaffie in a dissenting opinion, said that "the transportation system we are in part responsible for is threatened as never before," and "yet here, by highly technical reasoning, we reject tariffs intended to institute reasonable charges for services now performed without charge." How can anybody believe in the intelligence or fairness of a body which continues, even under such conditions as now exist, to grind out decisions so obviously dictated by technicalities and prejudice?

It was said of King Charles II that he never said a foolish thing and never did a wise one. Members of the commission, ever since it refused to authorize a general advance in rates in 1911, have been expressing themselves hopefully about the future of the railways and indicating a disposition to follow a constructive policy of regulation; but only very rarely have a

majority of its members voted in the decision of important cases as favorably to the railways as they have talked. The *Railway Age* will believe that the present members of the commission really desire to see earning capacity restored and the railroads saved from government ownership when they begin to vote that way as well as talk that way.

More Comfort for Patrons

One highly-constructive move which a number of railroads are making in 1932 is to continue the improvement of their passenger-equipment standards with a view to holding and, if possible, increasing passenger traffic. This is essential from the point of view of passenger earnings, prestige and the favorable effect upon freight-traffic routing. Improvement programs already under way provide for air-cooling and conditioning installations and the complete renovation, in accordance with modern requirements, of the interiors of a considerable number of old cars otherwise in good physical condition and not obsolete from a structural-design standpoint.

While considerable progress has been made in the past in raising passenger-equipment standards, plenty of room for improvement still remains. In spite of the installation in recent years of some of the finest new sleepers, diners and lounging cars, with all modern conveniences, too much old equipment of this type is still far from attractive. Coach-equipment conditions generally are even less appealing to the public. Dirty, dingy, poorly-lighted and ventilated coaches, with straight-back, hard seats, and no lavatory facilities, are still in daily use, notwithstanding the tendency of reduced traffic to send less desirable equipment of all kinds to the storage tracks.

Much of the reconditioning work on passenger equipment, including coaches, can be done at relatively little expense, in accordance with carefully-developed plans of rehabilitation, decoration and equipment. It is surprising what a great improvement can be effected by replacing archaic window designs and "gingerbread" interior trim with simple lines and panels. Adequate ventilation and heating with automatic control, also ample lighting facilities with attractive fixtures, are essential. The provision of comfortable seats should not be overlooked, preference being given, in coach equipment, to rotating, reclining seats.

With either new or reconditioned cars, the interior design, decoration and equipment schemes should obviously be prepared by experts who have had long experience with the tastes of the traveling public. More importance than many railway officers appreciate rests in the selection of the proper colors, fabrics and lighting fixture designs to harmonize with the general interior treatment. The cost of securing this expert advice is insignificant compared to the probable cost of embarking on ill-advised programs which will not produce the desired results.

Recovering Lost Traffic

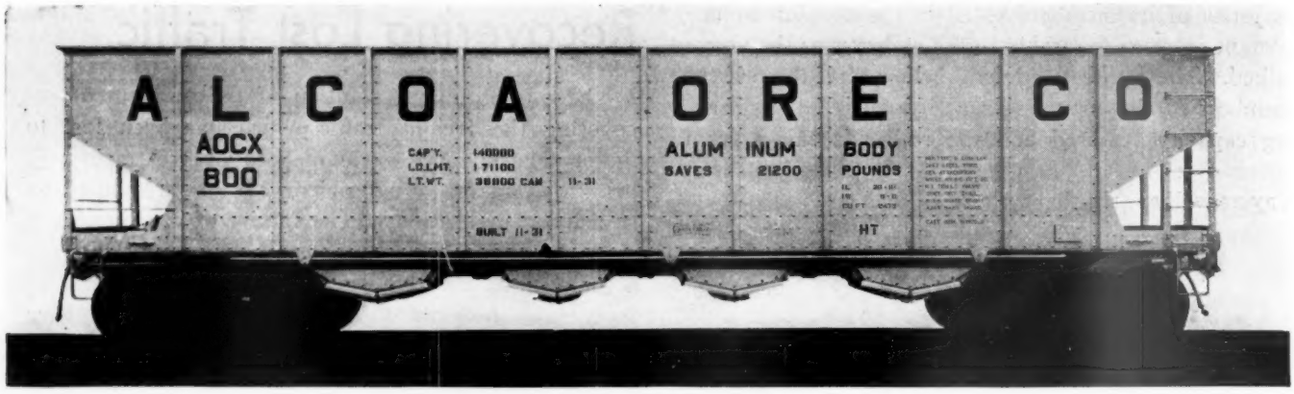
There is no simple solution of the problem of recovering the freight traffic which has been lost to motor trucks. No single method of treatment will bring the answer to a problem that is surrounded by so many complications. The failure of certain efforts made by the railways to meet truck competition to accomplish all that has been expected of them, therefore, need not cause discouragement. Competitive motor trucks have been entrenching themselves in their present position for at least 10 years. They will not be dislodged in the first attack.

Competitive motor trucks have been successful because they have offered shippers service and rates more attractive than those which the railways have been able to offer. Excepting those who realize that the maintenance of efficient and financially stable railway service is worth more to them than the relatively small amounts saved in freight charges by patronage of the railroads' subsidized competitors, shippers must be offered equal or better service and comparable rates by the railways before they will again patronize them.

The railways have gone a long way during the past few years in improving their service. Many of them are making overnight deliveries between points as far as 300 and 400 miles apart. Many of them also have offered pick-up and delivery service at no extra charge. A number of them have adopted the motor truck to coordinate railway and highway service in other ways, and to make available to shippers the advantages of both without the disadvantages of either. Yet traffic still moves by truck.

This is no cause for pessimism. With certain exceptions, the differences in the rates charged for transportation by truck and by rail have not been eliminated. Under no regulatory authority as to rates, and benefitting to an untold extent from their freedom to use the public highways as their place of business, competitive motor trucks have engaged in rate-cutting to an intensified degree. Under existing circumstances, the railways cannot meet the rate competition of the motor truck, for the reason that there is no pretense of a stable basis of truck rates. Lacking other employment and having found it easy to acquire the necessary rolling stock, individuals by the hundreds are going into the trucking business and resorting to rate cutting as the only means known to them to secure business. Thus they are cutting not only the railways' throats, but also their own.

This situation will be corrected. Men will not continue indefinitely to carry on trucking at a loss. An aroused public opinion will insist that the trucks pay their own way and that the many shall no longer be taxed for the benefit of the few. It will demand that truck rates be subjected to control to eliminate the unfair discriminations now so prevalent. When this happens, the railways will find it possible and perhaps even easy to compete with motor trucks on a rate basis as well as a service basis.



Side View of Alcoa 70-Ton Hopper Car for the Alcoa Ore Company, Built by the Canton Car Company, Canton, Ohio

Aluminum Placed on Trial in Hopper Cars

Alcoa Ore Company buys ten 70-ton aluminum hopper cars from Canton Car Company

WHEN the Alcoa Ore Company, subsidiary of Aluminum Company of America, recently placed in service ten 70-ton hopper cars with bodies made from aluminum, it definitely put the metal on trial as a material for freight-car construction. The practicability of aluminum for passenger cars, electric locomotives, tank cars, electrified suburban trains, rapid transit cars and street cars is already being demonstrated, but in none of these cases is the test so severe as it is in the hopper car. The performance of the 10 cars will, no doubt, be watched with more than passing interest by the railroads throughout the country.

The cars have a length over striking castings of 41 ft. 11 in.; an inside length of 39 ft. 11⅞ in.; an inside width of 9 ft. 6 in.; and a height of 10 ft. 6 in. from rail to top of body. As constructed by the Canton Car Company, Canton, Ohio, each car weighs 38,900 lb. Similar cars built for the Alcoa Ore Company to the same general dimensions from the heavier materials weigh 60,100 lb., or 21,200 lb. more than the aluminized units.

In order to accomplish this saving of 21,200 lb. in dead weight, approximately 12,500 lb. of aluminum plates, shapes and castings were used in the fabrication of the car. The metal was used wherever it was thought to be an engineering possibility and for some parts of the car the applications represent a distinct innovation.

Standard construction methods and materials were employed for the trucks, brake equipment, safety devices, draft gears and couplers, center plates, door mechanism and rivets. This does not necessarily mean that for some of these parts aluminum could not be employed. Aluminum rivets were used in one of the cars and aluminum could have been used in the construction of the safety appliances were it not for the present rules of the Interstate Commerce Commission which require the use of steel. Further savings in weight could have been accomplished through the use of aluminum in many parts of the brake equipment.

In selecting the aluminum alloys to employ in the construction of the cars, three factors were considered: (1) The strength required for a given part; (2) the formability of the alloys, and (3) the ability of the alloys to withstand the corrosive influences of lading and of the atmosphere. Since the cars are to be used in the transportation of not only bauxite, the ore of aluminum, but sulphur and soft coal, the effect of sulphur in one form or another on the alloys was a consideration of prime importance.

For all parts of the car which were highly stressed, the heat-treated, strong aluminum alloy 17ST was employed. (The physical properties of these alloys are shown in the table.) There are a number of strong aluminum alloys which possess physical properties somewhat similar to 17ST and, if strength alone were the deciding factor, any of these could have been used. The corrosion resistance of 17ST, however, is superior to that of the other strong alloys and this obviously warranted its selection. In a few instances, it was necessary to use 17S alloy in the annealed condition (17SO) because of its better forming characteristics; however, these parts were subsequently heat-treated to obtain 17ST.

The side, end, floor and hopper sheets were fabricated from 4S alloy plate in the quarter or half-hard temper. This alloy has approximately the same corrosion resisting qualities as commercially pure aluminum and strength characteristics intermediate between the common alloys and the strong alloys. In the quarter and half-hard tempers, 4S alloy does not possess the forming characteristics of some of the other aluminum alloys, but since the forming operations necessary in the fabrication of these parts of the car are of small magnitude, formability played but little part in the selection of the

alloy. In yield strength, the alloy in the half-hard temper approaches 17ST, and since it does not depend on heat treatment for its physical properties, it is somewhat cheaper to manufacture. Its selection was therefore influenced by its lower cost.

With the exception of the brake-lever badge plate, which was cast in No. 43 alloy, the castings used in the car body were made from No. 197-57 alloy. These castings included: Front and rear draft lugs, bolster center brace, side bearings, hopper to end floor-sheet connection, striking castings and push pole pockets. No. 197-57 alloy was employed for these parts because of its strength and shock-resisting qualities.

As important as weight reduction is in any type of railroad rolling stock, it was not the weight-saving characteristics of aluminum which prompted the use of

Average Physical Properties of the Aluminum Alloys Used in the Construction of 70-Ton Hopper Cars

	Alloy	Condition	Yield strength, lb. per sq. in.	Tensile strength, lb. per sq. in.	Elongation, per cent in 2 in.	Brinell hardness
Wrought	17SO	Annealed	10,000	26,000	20	45
	17ST	Heat treated and aged	35,000	58,000	20	100
	4S¼H	Quarter-hard temper	25,000	31,000	6	55
	4S½H	Half-hard temper	31,000	35,000	5	65
Cast	43	As cast	9,000	19,000	4	40
	197-57	Heat treated	25,000	42,000	15	80

the metal in the fabrication of these hopper cars. Here the chemical properties of the metal warranted the use of aluminum as they did in the fabrication of the tanks on tank cars a year or so ago.* Coal and sulphur are particularly destructive to the materials commonly employed in hopper-car construction. The life of such hopper cars is extremely short and their maintenance unusually high. Theoretically, sulphur and soft coal have no effect on aluminum. If this trial application for aluminum is successful, it undoubtedly will find wide application for this type of service.

The value of weight reduction in hopper cars, at the present time, is rather indefinite. No attempt was made to redesign the present standard hopper car of the Alcoa Ore Company when the 10 aluminized units were built. If this had been done, undoubtedly a greater weight saving could have been effected. However, the elimination of 10.6 tons of dead weight points to the savings which can be accomplished through the use of the light, strong alloys of aluminum.

The Underframe

The center sills are built up of plates and angles. The web plates are ½ in. thick and the top flange angles 3½ in. by 3 in. by ½ in. turned out. The bottom inside flange angle is 4 in. by 3 in. by ½ in. and extends through the bolster and the center-sill brace casting. A bottom angle 4 in. by 3 in. by ½ in. extends the full length of the center sills. The top cover plate, which is ½ in. thick, extends the full length of the center sills. All of the plates and shapes in the center sills are aluminum alloy specification 17ST. The sills are reinforced at the body bolsters with cast aluminum braces. Between the bolsters, the sills are further reinforced with three pressed plate spacers ¼ in. thick. The rivets used in nine of the cars are standard structural-steel rivets while those in the tenth car are 17ST strong aluminum alloy rivets. In each case, the rivet holes were sub-punched 1/16 in. on the diameter and reamed to 1/16 in. larger than the diameter of the rivets when assembled.

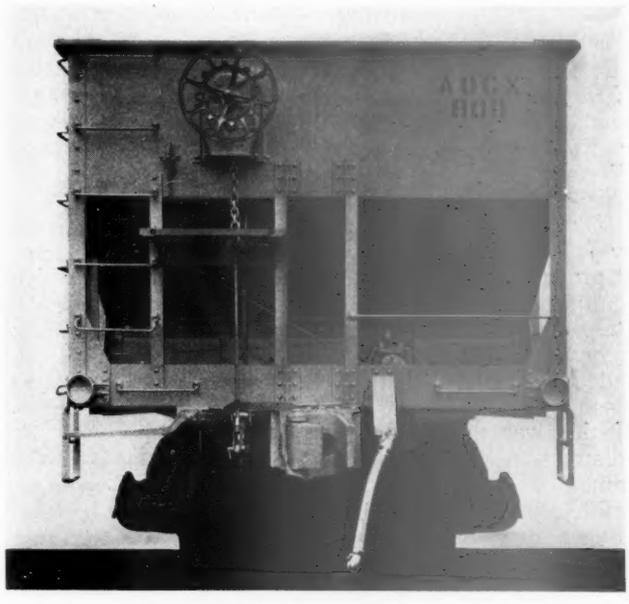
* See *Railway Age*, March 15, 1930, Pages 647-649.

The body bolster is made up of plates and angles, a web plate ⅜ in. thick being connected to the floor sheets by a top chord angle 3½ in. by 3½ in. by ⅜ in. The bottom flange angle is 5 in. by 3 in. by ⅜ in. The bottom cover plate is ⅝ in. thick and 15 in. wide. The bolster and side connection angles are 3½ in. by 3½ in. by ⅜ in. and the side-bearing stiffener angle is 3 in. by 3 in. by ⅜ in. The bolster and center-sill connections are all ⅜ in. hot-pressed plate of 17SO, finishing as 17ST. Two gussets are provided back of each bolster of ¼-in. plate and are connected to the bolster center-sill connection, center sills and slope sheets. The body side bearings are made of aluminum alloy specification 197-57. All plates and shapes in the body bolsters are of specification 17ST.

The Car Body

Side Construction—The sides of the car consist of 12 ¼-in. plates reinforced vertically with 11 pressed stakes. The top chord angle is a 4-in. by 3½-in. by ⅜-in. bulb angle. The bottom chord angle is a 4-in. by 4-in. by 5/16-in. angle. The side sub-sills consist of 8-in. channels weighing 4.89 lb. per ft. The connections of the side sill at the bolster are ¼-in. plate gussets. Roping staples of forged steel are provided at each corner of the car riveted to the side sub-sill. At the side stakes where the inside gussets do not connect to the side sheets, a splice plate is provided. The top corners of the car are connected with ¼-in. pressed corner cap plates. All of the side sheets and splice plates are of aluminum alloy specification 4S½H. The corner cap is made of specification 17SO, heat-treated to 17ST. All other parts of the side construction are of aluminum alloy specification 17ST with the exception of the safety appliances which are open-hearth steel forgings.

End Construction—The end sheets are ¼ in. plate, flange at the bottom of the sheet to connect to the slope sheet. The top of the end sheet is reinforced with a 4-in. by 3½-in. bulb angle. The end sills are 10-in. channels, weighing 8.84 lb. per ft. The corner posts are 4-in. by 3½-in. by ⅜-in. angles and the end posts 3-in. by 3-in. by $\frac{5}{16}$-in. angles. These are attached to the end sheets and end sills with 3-in. by 3-in. by $\frac{5}{16}$-in. angle connections. The end sills and the corner posts are connected with $\frac{5}{16}$-in. gusset plates. The corners of the



An End View of the Car

car are provided with cast push-pole pockets of aluminum alloy specification No. 197-57. The end sheets and brake-step bracket are of specification 4S½H. All other parts of the end construction are specification 17ST with the exception of the safety appliances which are open-hearth steel forgings.

Floor Construction—The floor plates are ⅜ in. thick, flanged at the ends of the slope to connect to the side sheets. The end slope sheets at the longitudinal center of the car are connected with ⅜-in. butt straps. Intermediate floor sheets are flanged to connect to crossridge plates. The end inside hopper sheets are connected to the end slope sheets with aluminum alloy castings which are also riveted to the center sills of the car. All of the hopper sheets are ⅜ in. thick and riveted with ¾-in. rivets.

Doors—Each hopper is provided with double doors made of ⅜-in. 17ST plate. The door spreader is built up of 4⅛-in. Z-bar, weighing 4.44 lb. per ft. The door closing mechanism is of the Lind type. There are 16 doors on each car. These were hot-pressed from 17SO plate, finishing as 17ST.

Crossridge—The crossridge gussets, of which there are three on each car, are made of ¼-in. plate. The angles connecting to the side of the car are 3½-in. by 3½-in. by ¼-in. back to back. Along the sloping edge of the gusset a reinforcing angle, 2½ in. by 2 in. by ¼ in., back to back is used. The bottom flange angles are 3½ in. by 3½ in. by ½ in., back to back. The bottom tie plate is ½ in. thick. The gusset plates are made of aluminum alloy specification 4S½H and the center-sill spacers are made of specification 17SO and heat treated to 17ST after forming. All other plates and shapes in this section of the car are specification 17ST.

With 6-in. by 11-in. journals, the cars have a load limit of 171,100 lb. The space capacity is 2,475 cu. ft.

I. C. C. Fuel Hearings Continue at Chicago

CONTINUING beyond the testimony reported in the *Railway Age* of March 19, Chicago hearings in connection with the Interstate Commerce Commission's investigation of railway fuel practices (Ex Parte 104, part 1) next involved the presentations of the Atchison, Topeka & Santa Fe, the Chicago, Milwaukee, St. Paul & Pacific, the Chicago, Rock Island & Pacific, the Illinois Terminal, the Chicago Great Western, the Alton, the Green Bay & Western and the Chicago, Burlington & Quincy.

The Santa Fe's fuel purchasing policy, as summarized by J. J. Conn, assistant general purchasing agent, aims at procuring coal and oil "at the lowest prices at which continuous and dependable supplies can be assured." He added, however, that in the making of contracts frequent conferences are held between the purchasing and traffic departments. The road purchased 1,632,000 tons of coal and 12,806,000 barrels of oil in 1931; most of this was procured under contracts although some "distress" fuel oil is purchased. While some of the annual coal contracts are awarded on the basis of competitive bids, coal prices generally are fixed after negotiations with operators and contemplate a reasonable profit to the latter. Likewise fuel oil prices are arrived at after similar negotiations in which bids received and posted oil prices are considered. Contract prices in 1930 for fuel oil from Oklahoma and Texas fields ranged 45 to 80 cents a barrel. Fuel oil for the Coast Lines is purchased through the General Petroleum Company whose prices in 1930 ranged from 65 to 85 cents a barrel plus a 25-cent per bbl. pipe line charge. Spot oil purchased in the same year ranged in price from 50 to 83 cents.

Reverting to his coal testimony Mr. Conn justified, as the lowest price at which a coal giving better satisfaction was offered, the delivered cost of $2.93 for strip coal from mines on the Alton as compared to $2.45 for shaft coal delivered at the same point from mines on the Santa Fe. It developed also in the course of this questioning that a local mine in which the Santa Fe is alleged to be interested had been shut down and that the Santa Fe waived per diem on its cars used for shipping company fuel from the Alton mines. Records were subsequently introduced purporting to show that the Belt Railway of Chicago purchased mine-run coal under contract at $1.95 a net ton from a mine on the Alton as compared with $2.15 to $2.25 paid by the Alton and $2.60 paid by the Santa Fe for 1¼-in. by 6½ in. egg. Mr. Conn maintained, however, that the Santa Fe paid no premium for coal at junction mines for traffic reasons and contended that other roads generally pay more than the Santa Fe for coal from mines local to the latter. He explained in concluding his testimony, that spot orders are placed to aid producers but that contracts are necessary in order to assure a dependable supply of both coal and oil.

With the exception of water-borne coal delivered at the head of the Great Lakes, all coal purchased by the Milwaukee is procured from mines local to the road or its subsidiaries. Annual contracts are awarded, D. C. Curtis, chief purchasing officer, testified, and prices are based on bids received. The business is distributed in such a way as to keep the maximum number of mines in operation, to foster competition and to produce the maximum amount of traffic but contracts contain a price clause designed to give the Milwaukee the benefit of any lower prices at which other roads obtain the same coal.

Since 1921, when the Milwaukee acquired trackage rights in Indiana, the bulk of the road's fuel coal has been purchased in that territory; mines there are encouraged by fuel orders to find outlets for their commercial coal on Milwaukee lines west of Chicago. Mr. Curtis was unaware that other roads were buying Indiana coal cheaper than the Milwaukee and he thought his road was purchasing at the lowest prices available. Generally, he said, no distinction is made between strip and shaft coal but his attention in this connection was called to a price of $2.10 for shaft coal and $2 for strip coal from the Binkley Coal Company, the largest Indiana operator local to the Milwaukee. The witness justified the $2.10 price on the ground that it was tied up with the $2 price for strip coal, which latter became a lever for the reduction of higher strip coal prices demanded by other operators. The lake coal, Mr. Curtis explained, is purchased only for protection against shortages and is stored for this purpose. Contracts for the entire winter supply of this are awarded to sellers bidding the lowest delivered price.

Fuel oil, which is used west of the Rocky Mountains, is purchased from the Richfield Oil Company of California. This is delivered by boat at Seattle under contracts which give the Milwaukee the benefit of any downward adjustment of prices. The present price at Seattle is 84½ cents a barrel having been reduced from $1.

Rock Island prices for fuel, both coal and oil, I.C.C.

Attorney M. C. List observed, are generally lower than those paid by other roads in the same fields. This road procured approximately 927,000 tons of its 1930-31 fuel year requirements of 2,271,000 tons of coal from its own non-commercial mining subsidiaries in Iowa and Oklahoma. The remainder was obtained from local and off-line mines in Illinois and Colorado under contracts with producers and authorized agencies considered valuable from a traffic standpoint. Uniform prices for each district are fixed after bids are received and conferences held with operators; the final price is the lowest at which the coal is obtainable and contracts contain several clauses permitting revisions of the fixed price. The Rock Island witness was Frank Reed, vice-president of purchasing.

As to fuel oil Mr. Reed stated that this is obtained direct from refiners on the Rock Island lines or within switching distance. Fuel oil from Arkansas and the Louisiana field is purchased under yearly contracts and that from Oklahoma and Texas mainly on monthly bids.

A. P. Titus, vice-president of operation of the Illinois Terminal, testified that this road purchases 75 per cent of its fuel coal from on-line mines and the remaining 25 per cent from mines on foreign roads. This latter, the record showed, was obtained from 13 different sellers and originated at 16 different mines, all located in the same vein. The witness said that the road felt obligated to support its local mines which might be closed if they found no outlet for the coarser coals. He called the orders placed with the 13 sellers of off-line coal friendship orders and held that the road was getting satisfactory coal and at the same time keeping its customers friendly.

While the Chicago Great Western buys some Iowa and Missouri coal its principal source of supply is No. 6 vein in Illinois. This latter is mine run, egg and lump from strip mines costing from $1.40 to $1.50 per ton at the mine. The strip coal generally has been found as satisfactory as shaft coal for locomotive use and the higher price paid for the latter from one mine was considered justified by the better grade of coal obtained.

The Alton obtains the bulk of its coal from mines local to its lines and places the majority of such local orders with three companies. A small amount however is purchased in Missouri. This latter, J. F. Marshall, purchasing agent, admitted, is purchased for traffic reasons even though it is inferior to Illinois coal and higher in price. Alton coal prices are fixed after negotiations with operators and, according to Mr. Marshall, contemplate a profit above operating costs to the producers.

J. M. Zahorik, purchasing agent of the Green Bay & Western, testified that this road purchases lake coal on current orders from three Green Bay, Wis., dealers. The record showed one of these dealers to be the Hickman Williams Company, representing the fuel department of the Ford Motor Company, which supplied coal from the Pond Creek district of West Virginia. This latter in the 1930-31 fuel year was bought at $4.91 a ton on cars as compared with prices of $4.50 and $4.75 per ton paid the other two dealers. These prices were compared with $3.80 to $3.90 and $3.90 to $4.05 at which the Chicago & North Western obtained coal from the other two dealers and Hickman Williams respectively. The witness contended, however, that the better grade of coal justified the 41 cents per ton more paid to Hickman Williams and stated that the G. B. & W. had Ford Motor traffic before its fuel orders were solicited by Hickman Williams.

The Burlington purchased, according to records introduced, 2,785,000 tons of coal and 520,000 gallons of fuel oil in the fuel year beginning 1930, all of the fuel oil coming from refineries on the Burlington in Wyoming, while the coal supply consisted of 1,995,000 tons purchased chiefly from commercial operators on the Burlington in Illinois, 60,000 tons from mines on the Colorado & Southern, a subsidiary, and about 40,000 tons from jobbers. Except in a few cases, the coal is obtained on monthly orders based on the commercial traffic routed over the road during the previous year, adjusted every three months. All fuel is purchased at uniform prices for the year in each field on the basis of conferences with the producers, with differentials provided from different sizes of coal.

Fuel Policy of the Burlington

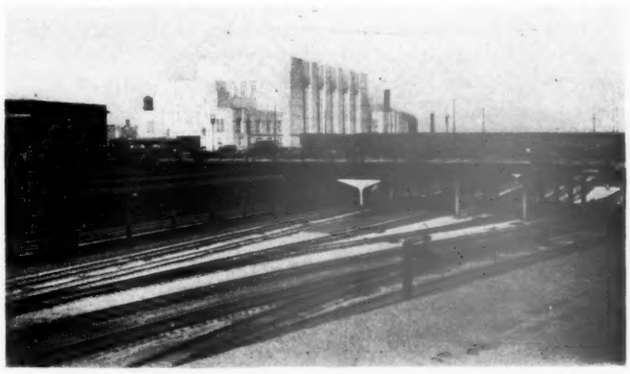
T. J. Thomas, assistant to the president, made an extended statement outlining the road's fuel policy. He discussed in this coal prices and coal market characteristics, traffic factors, the need for dependable sources of fuel supply and other considerations determining present practices.

Questioned for the reason for paying $2.15 per ton for strip coal and $2.57 for shaft coal in Northern Illinois, when it was paying only $2 for similar prepared coal in Southern Illinois, Mr. Thomas attributed the higher prices to the increased cost of producing the coal and further explained that the road has an interest in keeping Northern Illinois mines in production. The district, he added, has been an important source of supply of Burlington fuel for more than 30 years.

The witness was not aware that other roads were paying less for coal in Southern Illinois than the Burlington and said that such information would not be ignored in negotiating with operators. He added, however, that the Burlington has benefited from the downward trend of prices in recent years, but emphasized that the road, recognizing that the operators have been waging a bitter struggle to hold their business against fields paying lower wages, does not approve of extreme severity in fixing prices, and that he believed that even the prices paid were below production costs in some cases.

Questioned regarding the situation in Colorado, Mr. Thomas agreed that coal purchased in Southern Colorado is superior to the lignite purchased at higher prices in Northern Colorado, but explained that the operating cost was not as great as the comparisons indicated, considering that the coal from Southern Colorado is 3-in. screenings which would cost something to haul to Northern Colorado, whereas the lignite coal used on locomotives in Northern Colorado is lump and egg.

* * *



The New Union Station at Omaha, Neb., Looking East from Eleventh Street Viaduct

A Reply To Critics of The I. C. C.*

And some suggestions as to possible aids in solving the present railroad problem

By Claude R. Porter

Chairman, Interstate Commerce Commission

IT seems to be quite fashionable and the proper thing to do, whenever discussing the present unfortunate status of our railroads, to shy a not inconsiderable number of verbal brickbats at the Interstate Commerce Commission. All that is said and written along this line about the commission at the present time deals only in glittering generalities and never descends to specific particulars. In all of these onslaughts there is seldom, if ever, named or pointed out the definite thing that the commission has done or failed to do.

These attacks undoubtedly grow out of the fact that the rail carriers at the present time find themselves in a position which is far from desirable, and the blame for this must be placed somewhere if possible. There can be no debate upon the proposition that the railroad carriers of the United States for some time have been and now are confronted with an emergency threatening serious impairment of their financial resources and their capacity to assure the public a continuance of efficient and adequate service.

The nearest any of the critical persons come to dealing with definite things, so far as I have observed, is in two suggestions, which are quite generally made, with one of which the commission has nothing to do. With respect to the other, I frankly admit, it must accept full responsibility.

Is There Too Much Regulation?

The first suggestion commonly referred to is that the railroads are subject to an overdose of regulation. With this, of course, the commission has nothing to do. Whatever powers of regulation it possesses were placed there by Congress, whose agent it is. If the commission has too much control over the railroads, Congress is the proper party to take away its control and is the body to whom the appeal for relief should be addressed.

But is there too much regulation of the railroads? Here again our friends are very far from being definite. What power of regulation contained in the present law would they repeal? Would they take away the commission's right to prescribe a just and reasonable rate? Would they do away with the power of the commission to prevent discrimination, preferences, and rebates, and preserve equality of treatment among shippers, the foundation stone of the Interstate Commerce Act? Would they abolish the control over the issuance of stocks and bonds and return to the high financing of old? Would they repeal the requirement that, before a carrier can construct a new line of railway or abandon a line already in operation, it must secure the consent of the commission? Would they take away the authority of the commission, when a new rate is proposed which is protested by the shippers, to suspend that rate for seven months and in the meantime require the proponents of the new rate to justify it?

If any of these provisions, or any other of the present law should be repealed, why do they not come out in the open and say so and let people of the country know the actual reform they propose. The truth is that there is not too much regulation of railroads, but too little regulation of their competitors.

The second thing sometimes mentioned among the hazy generalities of criticism is that the commission did not grant the rather recent application of the carriers for a general increase of 15 per cent in freight rates. I shall not undertake or weary you with a defense of that decision of the commission. The published report must speak for itself. Suffice it for me to say that 11 men, keenly alive to the condition of the carriers, gave to all the evidence and the argument of counsel the best considerate judgment they possessed, and were unanimous in refusing to grant it.

It is impossible to give any consideration to the railroad situation apart from two fundamental facts, the first being that there is no great industry so closely related to every other industry in its prosperity or the lack of it as the railroads. Under no circumstances can the business of transportation rise much above the level of the business whose freight is being carried. With all branches of industry in a state of stagnation such as they have not been in years, it would seem to be the natural thing to find our railroads undergoing the severest pangs of adversity.

Nothing more accurately portrays the state of commerce and its flow than the carloadings of the Class I railroads. In fairly prosperous times, as is well known, the carloadings per week run from 900,000 to 1,000,000. For some time now they have been running around 550,000 per week, or something like 40 per cent below normal. There is simply a lack of traffic.

Competitors Confront the Railways

The second fundamental fact to have in mind, in addition to the present economic status generally, is that with the railroads this present depression differs from every other one through which they have passed in their 100 years of history. For the first time they are confronted with four vigorous and aggressive competitors. In every other depression, the railroads had a monopoly of whatever traffic was actually moving, but not so in the present one. We are in the midst, apparently unnoticed by many, of not an evolution but a revolution in transportation. In the four brief years that I have been privileged to serve on the Interstate Commerce Commission, the picture as to transportation has been completely changed.

Of these competitors the airplanes are at best the most spectacular but the least formidable, although no one can with safety prophesy what they may be doing five years from now. It cannot be said with certainty but nearly every passenger they have carried a long distance was one taken from the railroads. The mail

* From an address delivered at the Annual Meeting of the American Railway Engineering Association in Chicago on March 16.

they transported would otherwise have been carried by the railroads. The small package freight they transported could have been carried by the railroad-owned express company or the railroads themselves. The airplanes require terminals in the way of landing fields but no expensive rights of way. They are free to make such rates as they deem proper. They are not required by law to treat all equally. They are at perfect liberty to meet commercial conditions as they arise. It might be noted in passing that the postage you attach to your air mail letter bears less than one-half the actual cost of handling, according to the postmaster general, and results in actual deficits of approximately $17,000,000 a year.

As to just what is being done by the water borne carriers is difficult of ascertainment. From the War Department, office of the chief engineer, we learn that the traffic on the rivers, canals, and connecting channels of the United States for the calendar year 1930 was 276,760,000 tons, of a value of $3,557,000,000, and the Panama Canal traffic for the same year was 31,041,056 tons. The domestic traffic between the ports on the Great Lakes for the year 1929 was 141,185,669 tons. We do know that the bottoms floating on our inland waters are constantly increasing and more navigable channels are being opened each year. Under the law, upon application to the I.C.C., the railroads may be required to assist this rival carrier by making joint rates, so that they can reach the interior country with their traffic—the port-to-port business being in and of itself unprofitable. The watery rights of way cost these competitors of the railroad nothing to build or maintain, and nothing in taxes. The taxpayers of the country, to repair and maintain the rights of way on the Ohio and Mississippi rivers alone, have thus far expended something like $500,000,000, to say nothing about the hundreds of millions expended on the coastal harbors and the Panama Canal. The water carriers are largely free lances as to charges, and they are not required to treat their shippers on terms of equality. More than that, the government is itself in the business of the carriage of freight on a portion of the inland waterways, in competition with other carriers.

Pipe Line Competition

There are something like 106,000 miles of oil trunk and gathering lines in the United States. These lines gather and transport to tank farms, shipping points and refining centers more than one billion barrels of crude oil annually. There is a recent development in the way of 3,800 miles of gasoline pipe lines in the country. It had hitherto been thought impossible to transport gasoline by pipe line, but it is now a proven actuality of large proportions. All of this has cost the railroads many millions of tons of lucrative freight. Some of the pipe lines, being common carriers, are subject to regulation by the commission, but much of the crude oil is carried by private pipe lines that are not amenable to any regulatory body. In addition to the oil pipe lines, there are approximately 65,000 miles of natural gas pipe lines, and there are over 5,000,000 domestic consumers of this fuel. Oil lines are important in the fact, not only that they convey an article which formerly moved or could move by railroad, but with natural gas pipe lines, they are in many parts of the country displacing coal as a fuel, which is the largest single item of traffic of rail carriers.

The Most Dangerous Competitor

That the motor bus and motor truck constitute the most prominent and most dangerous competitor of the railroads at the present time is evident to all. The total number of motor trucks registered in the United States in 1930 was 3,481,000, while in 1925 it was 2,441,700. This represents a substantial increase in five years. No form of traffic seems to be immune from their operations, and the length of their haul is being constantly extended. It is apparent that there are two factors which are causing the diversion from the rails to the trucks: The rates charged, and the flexibility of the service. The rate is usually under that which obtains on the railroad and the delivery is from store-door to store-door in overnight service. The public is spending over a billion dollars annually in building new roads and rebuilding old ones, over which they (the truck operators) have a free right of way, with the direct cost to them, over that of any other citizen, a subject of much dispute. They are in most instances, and in interstate traffic entirely, free to charge much or little for their services as meets their own purposes. There is nothing to prevent them from charging one person a less sum than they charge another for the same service. They pay their labor such wages as they see fit.

What I have said is not in depreciation of the other transportation agencies, but rather to emphasize the tremendous change which is taking place in the transportation picture of our country and the intensive competitive conditions which confront the railroads. The basic difficulty at this time is the tremendous falling off of traffic available for the railroads, and the unusual competitive situation that is co-existent for the first time in such a situation. The lack of traffic is most certainly only a temporary affair. Sooner or later, and we hope in the near future, this feature of the problem must change.

The competitive part of the picture is bound to remain and is one worthy of our best thought. Briefly and concisely as I can, I beg to submit a few suggestions of what seem to be possible aids in solving the problem:

Economies

It was my privilege to hear a considerable number of witnesses who testified at the hearing of the application of the carriers for the 15 per cent increase in rates. It was very noticeable that many of the witnesses who were called, representing shippers, unhesitatingly expressed their satisfaction at the excellent character of the service now being rendered by the railroads and their desire for its continuation. It was a strong testimonial in favor of the railroad managements responsible for this high state of efficiency, and they are no doubt richly deserving of commendation. A great deal has been accomplished also in the way of economies of management and operation within the last 10 years. But there is still much that can be done. The waste and loss accruing continually, due to the intensity of the competitive situation as between rival carriers at a time like this, is very noticeable.

One of the largest single items of huge cost to the carriers, viewed as a whole, is the loss annually accruing from the passenger traffic. Since 1924 there has been a constant decline in the number of passengers carried, and the revenue therefrom has been constantly decreasing and the passenger deficit increasing. For the year 1930, before rentals and returns on property, it was not less than $100,000,000. This sum has to be made up by the payers of freight charges. I have no doubt that this passenger traffic problem is receiving the earnest attention of railroad executives, but vigorous measures in dealing with this tremendous loss should be immediately resorted to.

We know that in other lines of business and under

like conditions, the products of the business are offered at bargain prices. Bargains at such times seem to be what the people want. Is not the thing to do to offer some real bargains in the passenger business? We know that every day the railroads of the country are making substantial reductions in freight charges, either for the purpose of holding business to the rails which is threatening to leave them, or to regain business which has already gone. Why should not the railroads endeavor to sell more passenger transportation by making it so cheap and otherwise attractive that people will want to buy more of it, rather than encourage them to seek other methods of carriage or avoid purchasing it at all?

Consolidation

The consolidation of the railroads of the country into a limited number of systems should be encouraged and sympathetically treated both by the Interstate Commerce Commission and by Congress. The Transportation Act of 1920 specifically provided for the consolidation of all the railroads into a limited number of systems. Under that act, at least 50,000 miles of short or weak lines have been taken over by stronger systems and saved to serve their many respective communities. The actual accomplishment of consolidation would do much to preserve our railroads as the foundation part of a complete transportation system, adequate to meet the needs of a great commercial people. It would help to do this by equalizing the fortunes of the strong and the weak, and would result in a small number of uniformly strong and stable railroad systems. It would make possible large economies in both maintenance and operation. It would result in systems with stable financial structures and render their future financing more easily obtainable, economical and convenient. All of the systems could live and thrive on a fairly uniform rate basis, and it would make it possible for them to gradually build up a more simple and just rate structure.

Having consolidated the railroads of the country into a limited number of systems, they should no longer simply be railroad companies selling transportation by rail, but "transport companies" authorized and empowered to deal in all kinds of transportation, whether it be by air, rail, water or pipe line. Joint rates and through rates should be established in conjunction with any one or all of these other methods of transportation as is now done by rail and water. It is only by some such method that the various forms of transportation can be effectively co-ordinated and each made to render the highest form of service of which it is capable and yet the cheapest for the people served.

Regulation

The underlying purpose in the creation of the Interstate Commerce Commission was to prevent all forms of discrimination and to guarantee equal treatment of all shippers. With other forms of transportation, which are unregulated and free to charge as they please, competing with the railroads which are under strict regulation, regulation of railroads, so far as insuring equality of treatment is concerned, bids fair to become a failure. All of these various transportation agencies engaging in interstate commerce should be made subject to regulation, as are the rail carriers. This should be done with no thought of hindering or injuring any form of transportation, for every person is entitled to have and use that kind of transportation which he may think will serve him best, but to prevent unfair methods of competition between them. They should be placed under a single commission which should be directed to promote, encourage, foster, and preserve in full vigor each and all of them.

During the 10 years since the passage of the Transportation Act, the commission has authorized about an equal number of miles of railroad to be constructed and to be abandoned. The commission should adopt a more stringent policy regarding construction of new railroads. The day of the building of new railroads is substantially over. Only in rare instances, like that of a country yet unserved and undeveloped, should new construction be permitted. Under no circumstances should one railroad be authorized to invade the territory of another, which is being adequately served. On the other hand, the commission should be more liberal in permitting abandonment of unsuccessful short lines. Lines that are no longer self-sustaining and with no immediate prospect of becoming so, and incapable of feeding profitable traffic to the main line, should be permitted to be abandoned.

Recapture

In its last two annual reports to Congress, the commission has discussed at length the present recapture provision of Section 15-a of the Transportation Act, pointed out some of the serious objections to that section that exist, and recommended its repeal. Recently the chairman of the commission's legislative committee has appeared in behalf of the commission before the Committee on Interstate Commerce of the House of Representatives, to further present the reasons for its repeal. The principal basis urged by the applicants recently for the granting of a 15 per cent increase in freight rates was the need for the restoration of the confidence of the investing public in the soundness of railroad securities. It would seem that the confidence of the public inevitably would be affected by the fact that there hangs over the carriers a financial cloud in the way of recapturable service amounting literally to hundreds of millions of dollars. As rapidly as it can, under the compulsion of present law, the commission is presenting from time to time bills to various carriers, demanding payment of this indebtedness to the government. It is well known that few, if any, of the carriers have surplus to meet any such demands, and the recapture of the recapturable surplus, particularly at such a time, cannot fail in many cases to tax to the utmost the credit of the carriers because of the necessity for issuing securities for the purpose of reimbursing carrier treasuries.

This threat directed at carrier credit could be entirely eliminated by the repeal of the recapture provision of the law, and thus assure railroad management and investors alike that executive ability and thrift are entitled to receive their full reward, and that in times of plenty they may, as far as possible, under a system of reasonable rates, lay by out of their abundance for the period of stress and storm.

The railroads are, and for years to come will be, an essential instrumentality in the transportation of persons and property and a substantial factor in the economic welfare of our people, no matter how rapid may be the development of their present competitors. The present transportation problem is the problem of legislators, commissions, executives and business men generally. It carries a challenge which must not go unanswered by the people of this country. A fair, wise and proper co-ordination and development of all the present instrumentalities of carriage will give in the end, to this nation, a transportation system undreamed of at the commencement of the present century.

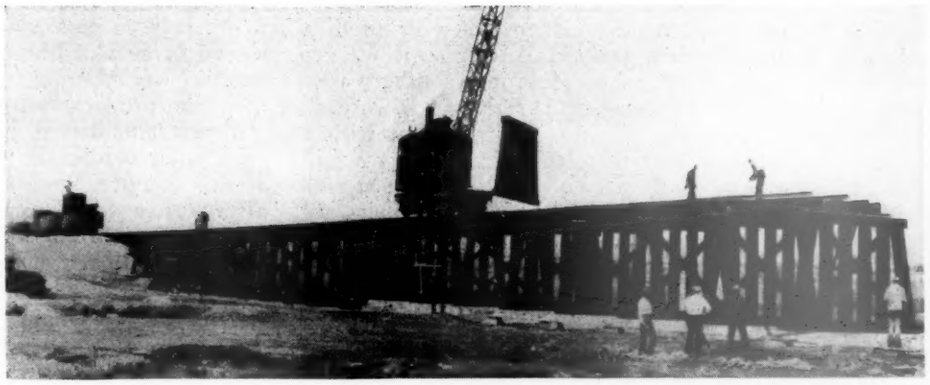
A Long Time Record in Timber Preservation*

The Atchison, Topeka & Santa Fe has been treating wood for use in bridges for 57 years

By R. A. Van Ness

Bridge Engineer, Atchison, Topeka & Santa Fe System

THE history of treated timber on the Santa Fe began in 1875, when a plant was built in Galveston for the creosoting of piles for the timber trestle bridge in Galveston bay. This piling was supposed to be given a 10-lb. treatment, but some of the piles were treated to refusal. The lighter treated piles stood up well for 10 or 12 years; and the heavier treated piles until the end of 20 years, at which time the trestle was renewed.



The Bents in This Frame Trestle Were Assembled at the Treating Plant Where All Timbers Were Preframed

It was not until 1885 that the Santa Fe built its own plant. This was at Las Vegas, N. M., and was used for the treatment of ties between 1885 and 1908 inclusive, for lumber treatment from 1895 to 1907 inclusive, and for the treatment of piling from 1895 to 1906 inclusive. In 1897 the Ayer & Lord Tie Company built a treating plant at Somerville, Tex., to treat ties, lumber and piling under contract for the Santa Fe. The Santa Fe took over this plant in 1904, and in 1906 built a new plant at this point. In 1898 the Santa Fe opened a plant at Bellemont, Ariz., which burned in 1906. In 1908 the Las Vegas plant burned, and a plant was built at Albuquerque in that year to take the place of the Las Vegas and Bellemont plants. In 1924 a plant was placed in operation at National City, Cal. In 1930 a plant was placed in operation at Wellington, Kan. Thus, the Santa Fe now has plants at Somerville, Albuquerque, National City and Wellington.

Extent of Treated Timber Bridges

Records indicate that the two oldest creosote-treated timber bridges still in service on the Santa Fe were constructed in 1899 on the main line in Missouri, and are of the ballast deck type. The deck timbers are 12-in. by 12-in. in section, and inspection indicates that these deck timbers have 10 or 15 years life remaining. There have been renewals, particularly of a certain number of sway braces, but these bridges can be considered good for at least 40 years' service.

The extent to which treated timbers have been used in Santa Fe bridges, can be seen from the data listed below. T-rail bridges are classed as steel bridges. Concrete arches and boxes, timber boxes and culvert pipe are omitted, but attention is called to the fact that by far the larger proportion of the timber boxes are creosoted.

Type of Bridge	As of January 1, 1931, in lineal feet of single track
Open deck timber bridges	477,004
Ballast deck timber bridges	287,321
Open deck steel	83,818
Ballast deck steel bridges	223,430
Reinforced concrete slab bridges	8,844

Thus, as of January 1, 1931, the total length of single-track bridges resting on timber and concrete pile bents, masonry piers and abutments, was 204.62 miles. Of this length some 48 per cent is of ballast deck construction in which treated timber only has been used. Records are not available on which to base definite statements regarding the extent to which treated timber is used in the open-deck timber bridges, but it can be stated that approximately 90 per cent of the pile bents are treated, and that within 20 years practically 100 per cent will be treated. The stringers of open-deck timber bridges were untreated until some five years ago, and up to that time it was the policy to replace untreated bridge ties with untreated material. Now that treated stringers are being used, all of the new open-deck bridges will have treated ties. Practically all ties are treated for open-deck steel bridges. The above data indicate that the Santa Fe is approaching 100 per cent treatment of timber bridges and that this status probably will be reached within the next 25 years, except for a small number of open-deck timber bridges on light-traffic lines in those climates where the present untreated timber bridges will still last for many years.

From 1885 to 1931 the Santa Fe treated about 300,-

* Abstracted from a paper presented before the annual meeting of the American Wood-Preservers' Association, at St. Louis, Mo., on January 27.

134,000 ft. b.m. of timber, and about 90 per cent of this amount was bridge timber. During the years noted, some 14,700,000 lin. ft. of piling was treated, and practically all of this piling was used in timber trestle bridges.

Type of Treatment

When the Santa Fe first began to use creosoted bridge timber it was obtained mostly from commercial concerns, and as the timber usually was ordered for quick shipment, sufficient time was not available for air-seasoning. It is now the practice to stock our plants sufficiently in advance of our needs to permit time for thorough air-seasoning.

Bridge timber and piling have been treated on the Santa Fe with creosote from the first, with various retentions of creosote for fresh and salt-water structures. We are now treating bridge ties with an 8-lb. mixture by the Rueping process. At present we are getting 14 lb. per cu. ft. of creosote into southern pine bridge timbers, and are treating Douglas fir to refusal. We are considering the adoption of treatment with a mixture of creosote and petroleum, in which we will put a maximum of 16 lb. per cu. ft. into southern pine bridge timbers and by incising the fir bridge timbers, we will get 13 lb. per cu. ft. of the mixture into the fir. We are now incising our Douglas fir timber and getting a 13-lb. creosote treatment. Southern pine piling is now receiving a 16-lb. full-cell treatment with creosote, and Douglas fir piling is being treated to refusal with about 13 lb. per cu. ft. We are considering the adoption of a mixture treatment for all piling and will treat them to refusal, but not to exceed 18 lb. per cu. ft. We are treating a small amount of red spruce piling.

The creosote being used varies but slightly from that specified as Grade 1, A.R.E.A. Specifications, 1929 manual. The oil in the bridge-tie mixture used at the National City and Albuquerque plants is of asphaltic base, from Seguro, Cal. The Somerville and Wellington plants are supplied with residue oil from Ardmore, Okla., and Ponca City, respectively.

The mixture treatment of our bridge ties calls for a 50-50 mixture of creosote and petroleum. This will be used also for bridge timbers and piling if a mixture treatment is adopted.

It is considered entirely safe to adopt a creosote-petroleum mixture treatment for bridge timbers and piling since there will be sufficient toxicity to inhibit the growth of rot-producing fungi, and the viscous oil tends to retard the evaporation of creosote. Therefore, it is felt that at the end of a number of years it is quite likely that there will be as much creosote remaining in the mixture-treated timber as there would be if straight treatment were used and evaporation proceeded at a faster rate. Most important of all, it is believed that the mixture treatment will greatly lessen the season-checking of the timber, particularly in the dry, hot climate of certain portions of the states of Arizona and California.

I mentioned previously that by incising Douglas fir bridge timber, we are getting a retention of about 13 lb. per cu. ft. of preservative. Some months ago, E. E. Chapman, our engineer of tests, completed a series of tests to determine, as nearly as possible, the weakening effects of incising on fir bridge stringers. Test results on incised untreated and treated, and non-incised treated fir stringers indicated that the incised treated stringer lost an average of only eight per cent in strength due to the incising. We do not object to this loss in strength in treated incised fir stringers because we believe that these stringers will, at the end of 40 years' service, be in better condition, with greater remaining strength than would be the case with similarly treated non-incised stringers having four or five pounds less initial preservative. Another vital factor which makes an incised fir stick desirable over a non-incised stick is that the incised stick requires only 15 hours to treat as against 24 hours for the non-incised stick, and of course the shorter time of treatment makes for a product having a minimum amount of treatment checking.

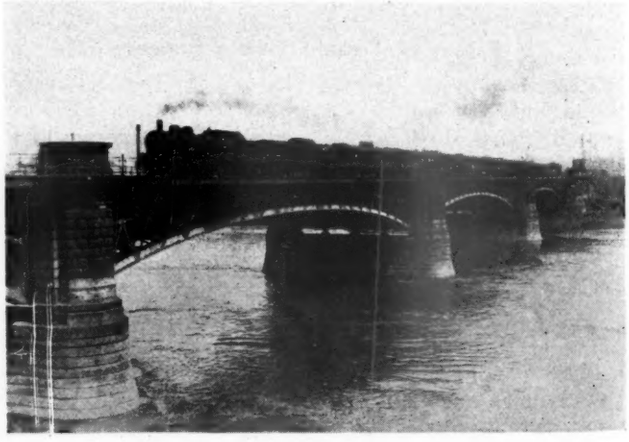
Practice in Handling Treated Timber

Creosoted timber bridges had not been in service many years on the Santa Fe before it was discovered that simply treating the timber was only half the battle in getting timber bridges that gave satisfactory service. It was found that it was poor policy to allow piling to be kept in the woods after cutting, but that they should be sent at once to the treating plant, supported on steel, concrete or treated timber skids, and allowed to season properly before treating.

Years ago, driven piles were cut off and the tops chamfered before the caps were drifted on. Because of this practice, thousands of piling decayed at the top after a few years' service. The chamfering of piles, after cutting off was discontinued, and before the caps were placed the cut surface of the piles was sealed with creosote and heavy oil, and the top covered with two-ply roofing paper, nailed down on the sides of the pile. Also, it was discovered that field holes in timber were causing rot, and thus the practice was adopted of swabbing field holes with hot creosote and a sealing compound, and also of treating any cut surfaces in a similar manner.

It was discovered in the early days that in driving piling the heart would sometimes be separated from the sapwood. After various improvements in practice, most of our pile driving is now done by double-acting steam hammers with a steel cap over the head of the pile to restrain the timber, with the result that we have practically no piling damaged in driving. The practice of preboring timber before treatment is increasing rapidly and, in addition, the timbers are being preframed before treatment. Our experience, and that of other organizations using treated timber for bridge structures, convinces us that bridge timbers can be bored and framed successfully before treatment, and we are preparing standard plans for open deck and ballast deck timber bridges, and timber boxes, on the basis of boring and framing the timber before treatment.

* * *



A German Passenger Train at Dresden

Railway Loan Policies Discussed at White House

WASHINGTON, D. C.

A STATEMENT by President Hoover that a "co-ordination of programs and policies has been arrived at by the government and the railway agencies" to effect the ends of "increased employment on one hand and stability in the financial structure of the country on the other" was issued at the White House on March 19 following a series of conferences regarding the policies to be followed by the Reconstruction Finance Corporation and the Interstate Commerce Commission in making loans to railroads.

These had included not only conferences between representatives of the railways and the government agencies but others held by the President on March 17 and 18 with officers and directors of the Finance Corporation, Commissioner B. H. Meyer of the Interstate Commerce Commission, the advisory committee of the Association of Railway Executives, and E. G. Buckland, president of the Railroad Credit Corporation, at which various differences of opinion which had developed within the government organizations were discussed. The conference with the railway executives, who were having a meeting of their own and were invited to the White House, was held on Friday afternoon and after it the White House gave out only the following brief statement: "The President has had conferences with the directors of the Reconstruction Finance Corporation, the members of the Interstate Commerce Commission and the Department of Commerce, interested in reconstruction matters, together with the executive committee of the Railway Presidents' Association and the chairman of the R. C. C., upon co-ordination of reconstruction activities. The conferences are still continuing."

President Hoover's Statement

Then, without any further conferences the President issued the following on Saturday morning:

"I have held a number of conferences for survey of the railway situation and for determination of general policies in respect to the railroads. The elements in these conferences are the directors and heads of staff of the Reconstruction Finance Corporation, members of the Interstate Commerce Commission dealing with these problems, and representatives of the Railway Credit Corporation.

"Examination of the financial problem confronting the railroads shows that it is of smaller dimensions than has been generally believed or reported. It is estimated that the financial necessities of the important railways of the country which are likely to require aid in meeting the interest and renewal of their maturing securities, and in meeting their other obligations during 1932, will be from $300,000,000 to $400,000,000. Of this amount the Railway Credit Corporation will provide a minimum of from $50,000,000 to $60,000,000 and it is assumed that many bank loans will be continued in the normal way. Therefore recourse to the Reconstruction Corporation by the railroads will be much less than was originally thought and even the mentioned amounts would be diminished by revival of the bond market and the placing of bond renewals in normal fashion.

"The problem is to handle the situation as a whole so as to lay the foundations for restored employment on the railways and through their purchases of supplies, and at the same time to establish confidence in the security of the bonds which are the reliance of great trustee institutions of the United States which are in fact the property of the entire people. The end to be attained is, therefore, one of increased employment on one hand and stability in the financial structure of the country on the other.

"The coordination of programs and policies has been arrived at by the government and the railway agencies to effect these results."

Some surprise was caused by the statement that the financial problem of the railroads is of smaller dimensions than has been generally believed, in view of the fact that most estimates of net income for this year are less than the results for last year, but it is understood that the present estimates of the financial requirements are less than some of those made by both corporations as to the amounts that would be asked by the roads. Up to March 22 the total applications to the Finance Corporation, by 48 railroads, amounted to $356,000,000, which included some amounts also asked of the Credit Corporation. These include so far mainly requests for money to meet interest, maturities, taxes and bills, with very little provision for improvement work outside of the application filed by the Pennsylvania for $55,000,000 and that of the New York Central for $7,000,000.

A plan had already been worked out by which the Finance Corporation has been making temporary advances on orders given by the Railroad Credit Corporation pending receipt of funds for the purpose by the latter, but the fact that traffic so far this year has fallen so far below that of last year indicates that the Credit Corporation may not be in a position to provide so large a share of the railroad requirements as had been expected, and it is already apparent that some of the roads would have been in hard straits if they had been entirely dependent on the proceeds of the rate increase. The amount for January, which has just been received by the corporation, as it is payable forty days from the end of the month, was only about $4,000,000.

Just what results followed from the conferences has not been made clear, and the President asked the railroad men not to talk about it. Some significance was attached to his statement that it was assumed that many bank loans will be continued in the normal way, because it is understood that the extent to which banks should continue to carry loans has been one of the points of difference, and the commission has deferred consideration of parts of several loan applications for the purpose of meeting bank loans not yet due with a suggestion that the bankers be asked to provide a fair share, or perhaps half, of the amounts.

Finance Corporation Discourages Publicity

The Finance Corporation has allowed very little publicity as to what it has been doing and has only announced loans to half a dozen railroads, although it is understood that it has now granted practically all of the 17 loans, to 15 railroads, for a total of about $54,000,000, which have thus far been approved by the Interstate Commerce Commission.

The commission makes public its reports approving loans, which in most cases include a very full account of the applicant's financial situation and prospects and even a rough O'Fallon valuation of its property. It also makes public memoranda of the applications and a statement of the purposes for which the money is desired.

The reports have shown that half a dozen or so loans have been approved to enable applicants to pay bank loans and release the collateral for additional loans from the Finance Corporation, but they have also shown that in several instances the commission has made an investigation only of the most immediate requirements and has reserved for further investigation and information the amounts asked to meet later requirements, without prejudice to consideration of additional loans. There has been no indication that any application has been refused but in several instances the company has been told to negotiate further with the bankers.

Applicants are required by the law to make a showing that they are unable to obtain funds upon reasonable terms through banking channels or from the general public and the commission has said in several of its reports that "it is our view that this question is committed by Section 5 of the Reconstruction Finance Corporation Act primarily to the corporation." The fact that a bank has stated that it is unwilling to extend a note beyond a certain date does not necessarily indicate a deadlock in the situation but apparently some of the railroads have been left for a time in an uncertain situation because of the differences of opinion at Washington and the efforts of both the bankers and the government to insist that the other carry a larger share.

Advances to Meet Bank Loans

The commission has, however, approved several loans to meet bank loans that were due immediately, notably in the case of the Nickel Plate, for which a loan of $9,300,000 was approved on February 24, including $6,000,000 to pay a loan maturing March 4, from the Guaranty Trust Company. This was approved by the corporation on the following day. The collateral thus released was transferred to the Finance Corporation.

In many cases the applicants have asked for their estimated requirements for the year, stating the dates on which various amounts would be needed, and naturally, the commission has not been able to pass upon the full amount at once.

The first case to be passed on was that of the receivers of the Wabash, who applied on January 23 for a loan of $18,500,000, including $9,750,000 for loans from nine banks. The commission, in approving a loan of $7,173,800 on February 10, held that consideration of a loan for the purpose of meeting bank loans should be deferred "pending early understanding or agreement with the banks as to the extent to which they can and will forbear in the matter of or extend these obligations."

On January 29, the Missouri Pacific applied for a loan of $23,250,000, to be available on various dates throughout the year including $13,050,000 immediately upon approval, and the $1,500,000 for interest due February 1 and the $2,800,000 due March 1 which were later approved. Although not mentioned in the report, correspondence filed in the docket of this case included a letter from William Wyer, secretary and treasurer of the Missouri Pacific, indicating that an official of the Bureau of Finance had suggested that the company ascertain the reaction of the holders of $11,700,000 of notes to a proposal that they continue to carry half the amount if the Finance Corporation would carry the other half. Mr. Wyer said that J. P. Morgan & Co. had indicated they were unwilling to agree to such a proposal and believed the notes should be paid on April 1 and on March 10 a revised application was filed asking money for this purpose by March 31.

In approving a loan to the Erie on February 19 of $4,458,000 on an application for $10,350,000, the commission referred to $5,550,000 of loans represented by 90-day notes to six banks in New York and one in New Jersey, including "such strong institutions as the Chemical Bank & Trust Company, the Chase National Bank of the City of New York, the Guaranty Trust Company of New York and the First National Bank of the City of New York." The report said that at the request of the commission the applicant had negotiated with the banks "on the theory that they should provide a fair proportion of the relief needed, and that if arrangements were made whereby about one-half the present short-term indebtedness could be carried by the banks, a considerable amount of collateral could be released and made available as security for the proposed loan from the Corporation. As a result of these negotiations, the applicant reports that the banks are not disposed to make any commitments on other than a short term basis. As extended negotiations in this matter would delay our action upon other pressing needs of the applicant, it is our view that this part of the loan should be deferred without prejudice to future action thereon."

The Northwestern in its application stated that it had a loan of $10,000,000 from Kuhn, Loeb & Co., due October 13 and had applied to that firm for an additional loan to meet its fixed interest charges and equipment trust maturities for the first half of the year but that the firm had declined to entertain the application or to commit itself to any further loans. The commission had approved a loan of $7,600,000 to this company, payable in installments and the corporation approved a loan of $1,910,500 of the amount of February 25, but the company later advised that it did not at once need the $850,000 which the commission had approved payable March 25. The amount needed for the bank loan was deferred for later consideration.

The commission has also deferred considerations of loans asked by the St. Louis-San Francisco to meet bank loans due in July, and by the Central of Georgia to meet a bank loan and notes amounting to $1,150,000. It also deferred consideration of other parts of the applications not due until later in the year, and it is understood that it has taken the position that it should not be rushed in its investigations now to take care of maturities a few months from now. On the other hand, as so many applications came upon it at once, it has not always been able to get out its approvals until some days after the due dates.

I. C. C. Activities

One feature of the situation is the extent to which the Interstate Commerce Commission has taken upon itself the power to decide upon loans and the collateral to be given. The law provided that the loans must have the approval of the Interstate Commerce Commission, but the circular issued by the corporation outlining the method to be followed in making applications for loans and stating the large amount of detailed information to be furnished said also that "the form of obligation and terms and security therefor must comply with the requirements of the Interstate Commerce Commission and of the Corporation." It is understood that this was drafted for the corporation by the commission and approved by the board of directors of the corporation, but it is understood that they discovered afterward that they had to a considerable extent been relegated to the role of "rubber stamps." They have, of course, the power to veto any approval by the commission, but seemingly they have no way of being more liberal or less exacting than the commission, and some railroad men consider that the commission has been rather meticulous as to the investigation it conducts of each application as well as rather exacting in the matter of collateral. For example some of them are wondering what bearing the commission's valuation of the railroad properties may have on the ability of the company to repay the loan, particularly since the commission has not been so meticulous about seeing that the railroads earn a fair return on any basis of valuation. It is understood that this situation has been considered at the conferences, but apparently nothing could be done about it and the commission has no idea of being regarded as a "rubber stamp."

Proposed Regulation of Stock Ownership Opposed

WASHINGTON, D. C.

VIGOROUS denial of assertions that the so-called holding companies affiliated with the Pennsylvania and the Van Sweringen railroads are interfering with the Interstate Commerce Commission's consolidation plan was made before the House committee on interstate and foreign commerce on March 17 and 18 by Herbert Fitzpatrick, vice-president of the Chesapeake & Ohio, Pere Marquette and Missouri Pacific, and C. B. Heiserman, vice-president and general counsel of the Pennsylvania.

Appearing in opposition to the so-called "holding company" bill, which they said would be more properly described as a bill to regulate individual ownership of railroad stocks, both Mr. Fitzpatrick and Mr. Heiserman said that such a bill would be unconstitutional, because the mere ownership of stock is not interstate commerce, and that the Alleghany Corporation, Pennroad Corporation, and others which have been particularly discussed in connection with the bill, are merely holding stocks of various railroads pending decision by the commission as to what unifications may be carried out by the carriers that are subject to its jurisdiction. Both insisted that the investment companies, as they preferred to call them, are comparable to individuals and cannot possibly effect unifications themselves or exercise control of the properties whose stocks they control in various degrees, without the approval of the commission which would be necessary for the election of common directors, the issuance of securities or consolidation. Congress has no power to regulate them, they said, unless they actually do something substantially affecting interstate commerce, but they insisted that mere ownership of stocks for investment in roads which might be considered parallel and competing in some instances, does not constitute a violation of the anti-trust laws.

Stating that the stocks were acquired for the purpose of "preparing the field" for eventual consolidation they showed that there would be little advantage in retaining control of some of the railroads involved in the event the commission should fail to approve the four-system plan, and Mr. Heiserman said that in some instances a service would have been performed for the eventual purchaser by the gathering together of a large or controlling block of stock.

What is needed to carry out the purpose of the consolidation provisions of the transportation act, both lawyers asserted, is an improvement of the law, along the lines of the Parker-Fess bills in the last session of Congress, to give the Interstate Commerce Commission affirmative power to authorize consolidations, which is now lacking, rather than the passage of the "holding company" bill, which they said would be a backward step. Mr. Heiserman said the defects in the present law were responsible for many of the ills of the railroads and the troubles of the commission, and that even if the four-system plan is approved amendments to the law will be necessary to effect actual consolidations except where they can be effected under state laws and approved by the commission under paragraph 18 of Section 1.

Some members of the committee seemed to have difficulty in understanding why the control of railroads now held in various ways by the Van Sweringen and Pennsylvania interests does not constitute "virtual consolidation" but both Mr. Fitzpatrick and Mr. Heiserman pointed out that the Northern Securities decision was not based on the mere ownership of stock by a holding company but on the finding by the court that it constituted a combination in restraint of commerce.

Mere ownership of stock cannot be regulated as interstate commerce, Mr. Fitzpatrick said, merely because of the nature of the property it represents and regardless of what the owner does or does not do. When pressed by members of the committee to suggest ways in which the bill might be changed, and as to what a holding company would have to do to bring it within the power of Congress, he said that the fundamental principle of the bill was so far from right that he did not see how changes in verbiage would help much and he made no suggestion as to any way such a company could affect interstate commerce unless it violated the anti-trust laws. He said that of course the commission has plenary power to regulate acquisitions by carriers in interstate commerce and that he was inclined to think that Congress has power to compel consolidations, although he would not go so far as to say it could order the sale of stock except by condemnation proceedings.

In explaining how the defects in the law have partly brought about the present situation and the competitive scramble among the railroads to acquire control of strategic properties which he said included some "foolish things," Mr. Heiserman pointed out for many years actual consolidations were impossible because there was no plan. The commission could authorize acquisition of control by lease or stock purchase under paragraph 2 of section 5 and the Nickel Plate effected a consolidation under state laws and then went to the Interstate Commerce Commission for authority to acquire the property under paragraph 18 of Section 1 and also for authority to issue the necessary securities.

After the commission had tried in vain for years to persuade Congress to change the law and had finally put out its complete plan of consolidation in 1929, he said, the railroads were throttled. They could no longer acquire control under paragraph 2 of section 5 except in accordance with the plan and the fifth system feature of the plan was impracticable. W. H. Williams did his best to work it out but could not do it and the railroads finally agreed on the four-system plan and asked the commission to modify its plan accordingly. But that plan is nothing but a geographical allocation, he said, and if it is approved, unless the law is changed to provide for consolidations under a federal consolidation law it will still be possible only to consolidate under state laws or to obtain authority for leases or stock control under paragraph 2 of section 5.

The committee could do nothing to help the railroads so much as to solve this consolidation problem, he said, either by amending the act so as to set up a national consolidation plan free of the states or by leaving the matter to the states with provision for final approval by the Interstate Commerce Commission. In the transportation act, he said, Congress instructed the commission to lay the foundation for consolidations but gave it no tools or machinery with which to build the structure. No power is given in terms to approve a consolidation and that, he said, is what started the trouble.

Some of the committee members seemed to think that Congress ought to have some power to prevent acquisitions of stock not in harmony with the plan, which is the object of the bill, but Mr. Heiserman pointed out that the plan is subject to change and that the owners of railroad stock can not carry out their plans unless approved by the commission.

Taking up the subject of the purpose of the holding companies, Mr. Heiserman said the railroads were at cross purposes and were reaching out to acquire desirable properties, although they knew they could not be held unless it was eventually approved by the commission. If the plan is approved not one of the railroads can acquire control of the properties involved without the approval of the commission, including its approval of the price to be paid. He insisted that the Pennroad Corporation is not controlled by the Pennsylvania and said that the plan by which its stock is held by a voting trust was adopted because if the stock itself had been sold publicly it could have been acquired by other interests adverse to those of the Pennsylvania.

He also recalled that the Interstate Commerce Commission had approved the acquisition by the Pennsylvania Railroad of the stock of the Pennsylvania Company, but said that the thorn in the flesh was the acquisition by the latter of stock of the Wabash and Lehigh Valley, which the commission had treated as an act of the Pennsylvania through an agent. The company, he said, contends that the acquisition was permitted by the Clayton act as an investment and that it has not been used in any way to suppress competition. If the four-system plan is approved the Pennsylvania will still have to apply to the commission for authority to acquire control of the Wabash.

It was expected that the hearing on the bill would be concluded this week.

Commissioner Eastman replied to the arguments made by Messrs. Fitzpatrick and Heiserman, on March 23, saying he had not charged that the holding companies had violated Section 5 except that he considered the acquisition of stock of the Lehigh Valley and Wabash by the Pennsylvania Company to be in violation both of Section 5 and of the Clayton act. He also said that the Erie, Nickel Plate, and Chesapeake & Ohio, parallel and competing lines, have been brought under a common control and that if the Pennsylvania does not actually control the New Haven and Boston & Maine it has "gone to the brink."

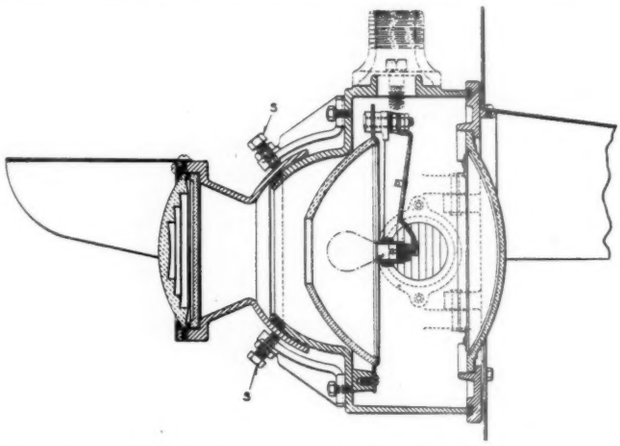
He said he had been observing the operation of holding companies for 25 years and that it is just as practicable to combine properties through holding companies as by consolidation or in other ways, particularly in the utility field, where it has become "one of the major scandals of modern times" and one of the causes for the present economic conditions. He said that the abuses have not been so great in the railroad field but that there have been sufficient of them, and he remarked that there had been no contravention of his testimony as to the extravagant prices paid beyond what could be justified on an investment basis. In reply to Mr. Fitzpatrick's contention that the railroads are still operated independently, Mr. Eastman said it is not necessary to have interlocking directors to exercise a common control and he pointed to the way J. J. Bernet has been shifted from the presidency of the Nickel Plate to that of the Erie and then the Chesapeake & Ohio and Pere Marquette. If the Chesapeake & Ohio is managed independently, he asked, why have its resources been used to acquire stocks of the Nickel Plate, Erie and the Pittston Company? He said that the holding companies have been used in the strategic warfare out of which has been developed the four-system plan for dividing the eastern territory, and that if the plan is not approved by the commission control will doubtless be retained except as it may be broken up by Clayton act proceedings.

Discussing the constitutional question Commissioner Eastman also relied on the Northern Securities case, saying that the issue before the court was not that of mere ownership of securities but that the court had shown that Congress may protect the freedom of interstate commerce in any ways that are appropriate and lawful. From this he argued that Congress has the same power to prevent interference with its consolidation policy, which represents a new rule of limited competition, as to prevent interference with commerce under the anti-trust rule. The court found, he said, that it could interfere with the ownership of stock because of its utilization to interfere with a policy of Congress.

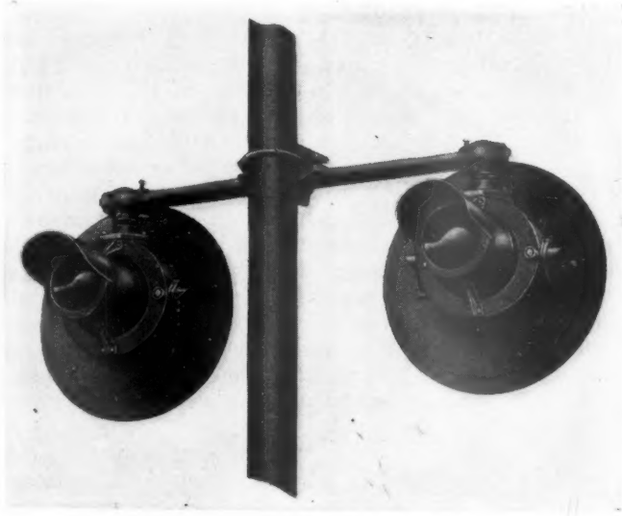
New Highway Crossing Signal

THE Union Switch & Signal Company has placed on the market a design of flashing-light signal for protecting highway crossings, which was developed to meet new requirements. This new signal, known as the "Union" Style HC-8, incorporates a back-light for conveying indications along the highway in the direction opposite those given from the front, with a greater back-light spread than has been available in the past.

The Style HC-8 light unit is so arranged that radial adjustment is secured by means of a concentric engagement between the spherical socket seat on the back of the main casting and the socket face of the back-light casting. This joint is dust proof and weather tight be-



The Lamp Filament Is at the Focal Point of Both the Reflector and the Back-Light Lens



Rear of Signal Showing Back-Lights

cause the bearing is against a graphite-coated felt gasket. The adjustment of the back-light is accomplished by loosening adjustment screws "S," as shown in the illustration, and tightening them after the proper alinement has been secured. This adjustment provides for alinement at any angle up to 15 deg. above or below, and 20 deg. to either side of the axial center line of the main light unit. In addition, a deflecting prism is mounted behind the back-light lens which spreads the beam 30 deg. to one side. This spread can be obtained either to the right or left as desired by turning the back-light casting in which the lens and deflecting prism are mounted. As provision has been made for mounting the hood in either of two positions, it is a simple matter to place it in its proper position after the back-light casting has been turned to obtain a spread to the right or left, as mentioned above. With this design, the back-light has an actual horizontal beam spread of 30 deg. which is effective within the limits of 50 deg. either side of the center line of the main-light beam.

The Style HC-8 signal has been so designed that under all conditions of adjustment of the back-light, the center of the lamp filament is located at the focal point of both the back-light lens and the parabolic reflector used to project the main beam through the front lens. This signal is also provided with side lights. The front cover glass is a 8⅜-in. diameter 30-deg. convex spread-light roundel. The front of the signal unit is hinged and can be opened only by applying a socket wrench, thus making a padlock unnecessary.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended March 12 was the highest so far this year, amounting to 575,481 cars. This was an increase of 16,000 cars as compared with the week before, but while coal loading increased 46,000 cars, there were decreases in several other commodity classifications. Miscellaneous loading was about 20,000 cars less. As compared with the corresponding week of last year the total showed a decrease of 158,099 cars, while as compared with 1930 the decrease was 305,827 cars. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Districts	Week Ended Saturday, March 12, 1932	1931	1930
Eastern	134,274	166,868	198,388
Allegheny	112,253	148,118	179,515
Pocahontas	41,328	45,261	47,442
Southern	91,962	120,791	142,657
Northwestern	64,612	85,700	109,215
Central Western	84,767	105,360	128,260
Southwestern	46,285	61,482	75,831
Total Western Districts	195,664	252,542	313,306
Total All Roads	575,481	733,580	881,308
Commodities			
Grain and Grain Products	27,194	36,239	39,252
Live Stock	16,801	20,018	23,864
Coal	141,450	140,491	130,141
Coke	7,216	8,598	9,689
Forest Products	18,967	34,793	60,222
Ore	2,245	5,875	8,977
Mdse. L.C.L.	185,122	220,329	252,271
Miscellaneous	176,486	267,237	356,892
March 12	575,481	733,580	881,308
March 5	559,439	723,215	873,716
February 27	535,498	681,221	899,498
February 20	572,606	713,156	827,560
February 13	562,465	720,689	893,140
Cumulative total	5,650,120	7,164,125	8,732,720

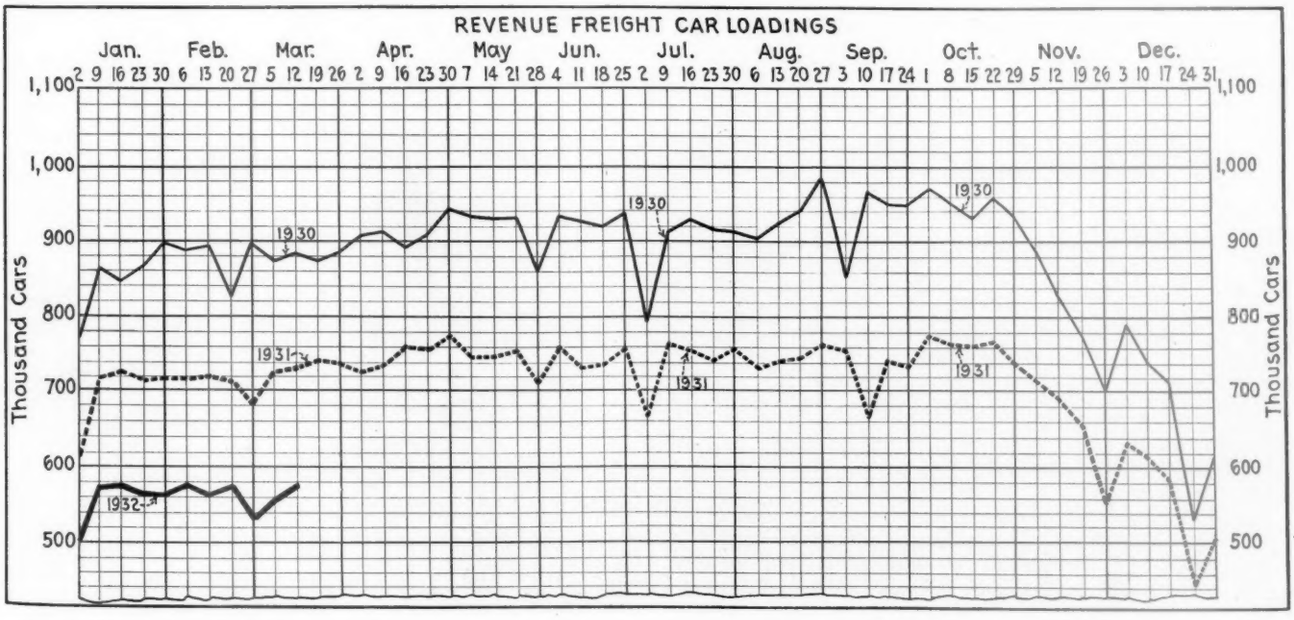
The freight car surplus for the period ended February 29 was 721,615 cars, a decrease of 5,510 cars as compared with the first half of the month. This included 366,620 surplus box cars and 278,722 coal cars.

Car Loading in Canada

Total car loadings in Canada for the week ended March 12 picked up in the western division but the cold wave which travelled eastward showed its effect in the eastern division and loadings fell off by 1,664 cars, more than offsetting the gain in the western division of 1,573 cars, the net decrease being 91 cars. Coal loadings increased by 984 cars although normally the loading begins to decrease at this time of the year and ore also increased by 374 cars.

Compared with last year, the total was down by 2,464 cars, all but 40 cars being in the eastern division.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
March 12, 1932	41,738	21,361
March 5, 1932	41,829	22,916
February 27, 1932	43,445	21,311
March 7, 1931	48,106	28,969
Cumulative Totals for Canada		
March 12, 1932	410,403	211,328
March 7, 1931	460,542	273,926
March 8, 1930	563,139	366,663



Motor Transport Section

How Two Roads Co-Ordinate Train and Bus Service

Reading and Cotton Belt find similar programs successful under widely different conditions

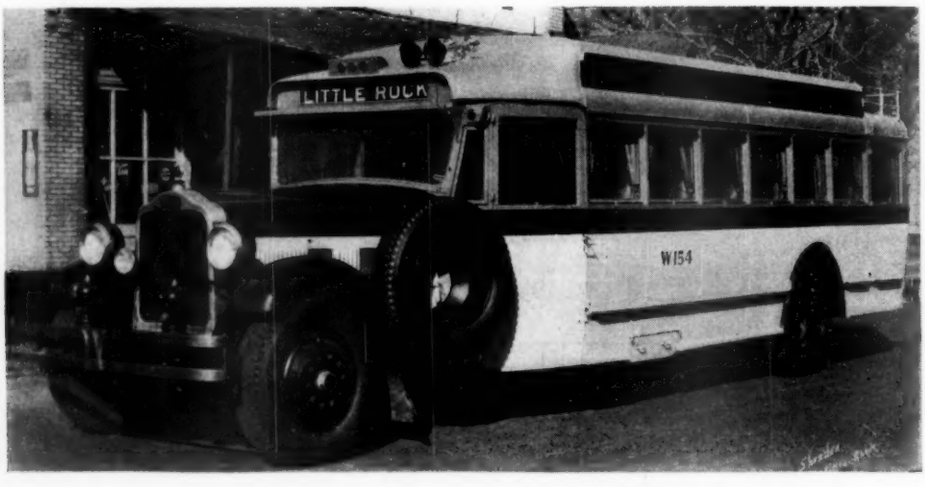
IN their physical characteristics and with respect to the territories which they serve, the Reading and the St. Louis Southwestern are as nearly unlike as any two railways in the United States. They have a minimum of characteristics in common, and might be expected, therefore, to pursue markedly different methods of operation. Yet the fact is that both roads have adopted the same policies in one respect, and with the same satisfactory results. This is in their provision of passenger service revised to meet conditions of declining passenger business and designed to hold or recover as much traffic as possible while effecting all possible economies in operation. Both roads have adopted the motor coach as a means of rendering economical passenger service and as a means also of attracting as large a volume of traffic as possible in the face of adverse business conditions and keen competition. Both roads likewise have been well satisfied with the results of their co-ordination of train and bus service, with the latter replacing train service to a large extent and at the same time supplementing the remaining train service.

The Reading and the Cotton Belt are not far apart in the mileage of their railway lines. The Reading has 1,575 miles of lines and the Cotton Belt 1,913. The Reading, however, consists largely of short branch lines, tributary to a few relatively short main lines. The Cotton Belt, on the other hand, consists principally of a main line between St. Louis, Mo., and Texas, with relatively few secondary main lines to such points as Memphis, Tenn., Little Rock, Ark., and Shreveport, La. The Reading, at the same time, serves a territory of dense population, while the Cotton Belt traverses states in which the population is relatively small. Under these widely varying conditions, however, the objects of both companies with respect to motor coach operation, and the history of their activities in co-ordinating motor coach and passenger train service, are strikingly similar.

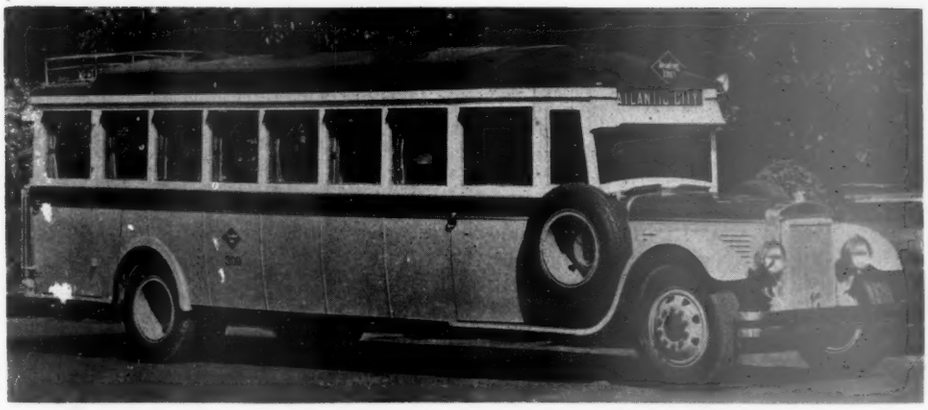
Bus Lines Parallel All Rail Lines

Both the Reading and the Cotton Belt have now practically completed their programs under which they set out to parallel virtually all of their railway mileage with motor coach service. The Reading began a little earlier, its subsidiary, the Reading Transportation Company, having started its first bus route in April, 1928. The Southwestern Transportation Company, motor coach operating subsidiary of the Cotton Belt, did not begin its operations until late in that year. The Reading now employs 81 motor coaches. This equipment serves some 35 routes of varying types, including train replacement runs on short branch lines and supplementary runs between the principal cities served by the Reading. The Cotton Belt, with 62 motor coaches, has a smaller number of routes, but these likewise range from short runs parallel to branch lines to through intercity routes.

The purposes of both railroads in going onto the highways with motor coach service were virtually iden-



One of the Cotton Belt's 62 Motor Coaches



A Reading Motor Coach Operating Between Philadelphia and Atlantic City

tical. Officers of the Cotton Belt have expressed their objectives in operating buses as follows: (a) To recapture local passenger business; (b) to substitute a more economical means of transportation for local passenger train service which it was necessary to provide even at a loss; and (c) to enable the remaining passenger trains to be operated on through schedules and with a limited number of stops. The basic purpose of the Cotton Belt was to effect a complete substitution of motor coach service for all local train service, wherever this was physically possible, and also to a large degree to substitute motor coach service for through day coach train service.

The Railways' Purposes

The purposes of the Reading, likewise, were to recapture local passenger business and to substitute a more economical means of transportation for local passenger train service. On account of the volume of traffic moving between the principal points served by the Reading, it has not affected the marked main-line passenger service reductions that have been made by the Cotton Belt, but it has put motor coaches on these routes as a supplementary means of transportation, to attain the object of recapturing local passenger business which had been lost to competitors.

The substitution of motor coaches for passenger trains on the Cotton Belt has been carried out to a remarkable extent. Reference to the current timetables of the railway and its subsidiary indicate this. Virtually the only steam passenger train remaining on the Cotton Belt is the "Lone Star," which, with its connections, runs between St. Louis, Mo., Memphis, Tenn., Dallas, Tex., Fort Worth, Waco and Shreveport, La. Other service on these main lines and on the branch lines of the railway is provided either by rail motor car service or more largely, by motor coach service on the highways. In fact, the preponderance of passenger service even along the main line of the Cotton Belt is provided by motor coaches. For example, on the main line between St. Louis, Mo., and Jonesboro, Ark., where there is one round trip train schedule daily, there are two round trip bus schedules, with morning and evening departures at both ends of the line.

Majority of Passenger Service Rendered by Bus

On account of highway conditions, the Southwestern Transportation Company does not operate motor coaches between Jonesboro and Brinkley, Ark., but south of that point and eastward to Memphis there is more than twice as much bus service, on nearly all lines, as there is train service. For example, there are two motor coach round trips daily between Memphis and Brinkley, compared to one train round trip, and virtually the same relation applies to train service between Brinkley and Waco, Dallas and Fort Worth. In a word, more than two-thirds of the passenger service between main line points on the Cotton Belt is rendered by motor coaches and less than one-third by steam passenger trains.

On branch lines, steam passenger train service is a rarity. Several of them, which do not have parallel highways over which buses can be operated economically, are served by rail motor cars or by mixed trains exclusively. Given satisfactory road conditions, however, the Cotton Belt has gone the limit on bus operation. Between Stuttgart, Ark., England, Pine Bluff and Little Rock, for example, all passenger service is rendered by motor coach, there being three round trips daily between these points. Likewise between Tyler and Lufkin, on one of the branches, there are three round trips daily by motor coach and one by rail motor car, with no steam passenger train service. Between Stuttgart and Gillett, a passenger train operates daily except Sunday, but it is supplemented by two daily round trip schedules. Under the circumstances, it is difficult to see where the Cotton Belt could go any farther than it has in replacing train service with motor coach service. With improved highway conditions, some additional highway operations will be possible, but for the present at least the Cotton Belt program with respect to the substitution of motor coaches for local trains, and to some degree for through day-coach trains, has been completed.

Buses Supplement Train Service

On the Reading, of course, the replacement of trains with motor coaches has not been nearly so complete as on the Cotton Belt. Train service of high frequency, proportionate to the dense traffic volume, is still operated by the Reading on its main lines, such as those between Philadelphia, Pa., and Atlantic City, N. J.; between Philadelphia and New York and between New York and Harrisburg (operated in conjunction with the Central of New Jersey); and between Philadelphia, Reading and Pottsville. Supplementing this train service, however, are frequent motor coach schedules. For example, the Reading Transportation Company, in conjunction with the Jersey Central Transportation Company, operates 19 round trip motor coach schedules daily between New York and Philadelphia. There is bus service of somewhat less frequency, also, between Philadelphia and Atlantic City, this being increased substantially during the summer. Supplementary bus service of considerable frequency is also operated in conjunction with the Jersey Central between New York and Harrisburg.

It is on the short branch lines, however, that the

similarity in the motor coach operating activities of the Reading and the Cotton Belt are most marked. For example, between Lansdale and Doylestown, a distance of 34 miles, the schedules are about evenly divided between motor coaches and passenger trains, about half of the train service formerly rendered having been withdrawn. Between Pottstown and Barto, there are now two bus schedules and two train schedules in each direction, one round-trip train schedule having been eliminated. Between Carlisle and Gettysburg, the train service has been cut in half, one train schedule having been replaced by two bus schedules. On some branch lines the substitution of bus service for train service has been complete. Between Mt. Carmel Junction and Mt. Carmel and between Milton and West Milton, for example, train service has been eliminated. In the case of the former, 19 round-trip train schedules were replaced by 14 round-trip motor coach schedules, while on the latter 11 motor coach runs took the place of a similar number of train schedules.

Satisfactory Results Obtained

Similar results have been secured by the Reading and the Cotton Belt through bus operation. Both roads have found that they can operate so-called intercity service between points of some size at a profit. On the other hand, train replacement lines find it difficult to attract revenues sufficient to pay their operating expenses.

The profit from these lines lies in the savings accomplished through the elimination of train service in favor of the less expensive bus service. On the Cotton Belt savings in operating expenses through the substitution of bus service for train service have aggregated more than half a million dollars annually, and a similar amount is being saved each year as a result of the Reading's substitution of motor coaches for unremunerative passenger trains.

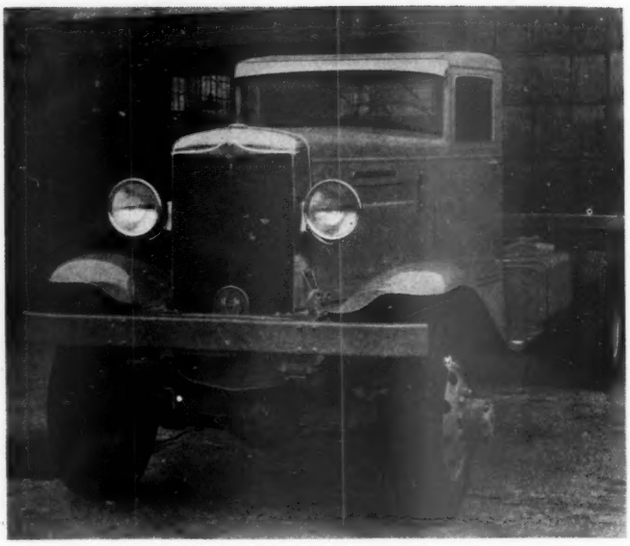
Four-Wheel Drive in Marmon-Herrington Trucks

A NEW four-wheel-drive motor truck, with a top speed of 50 miles per hour, a low center of gravity, a short turning radius, air brakes, and an auxiliary transmission which offers 12 forward and 3 reverse speeds, has been placed on the market by the Marmon-Herrington Company, Indianapolis, Ind. Five models are available, having gross capacities ranging from 18,450 lb. to 36,000 lb.

Model T-32, one of the series, has a 150-hp., six-cylinder Hercules engine, with a piston displacement of 707 cu. in., and a torque of 460 ft. lb. A down-draft carburetor and a seven-bearing crankshaft are employed.

The clutch is a 13-in. twin plate, and the 4-speed transmission, supplemented by the 3-speed auxiliary transmission, makes possible 12 forward speeds and 3 reverse speeds. The front axle has a 2½-in. axle shaft and is of the double reduction type with constant velocity steering ends. The rear axle is also of the double reduction type with a 2½-in. axle shaft. The Westinghouse air brakes have 9-in. diaphragms, slack adjusters, gun iron drums and moulded linings. The brakes are effective on all four wheels.

Wheelbases on this model range from 181 in. to 235 in., and the overall width is 96 in., including the dual rear tires. The total gross loaded weight is 32,690 lb., including the chassis, weighing 14,690 lb., a 3,000-lb. body and 15,000 lb. of pay load.



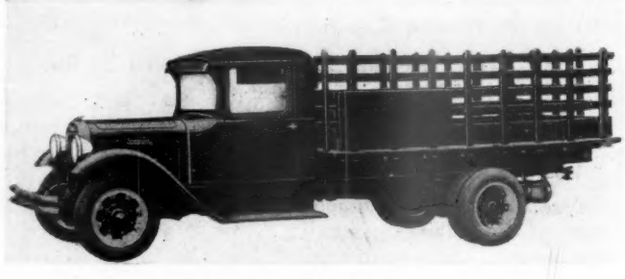
The Marmon-Herrington Four-Wheel-Drive Truck Chassis

New Stewart Two-Ton Trucks

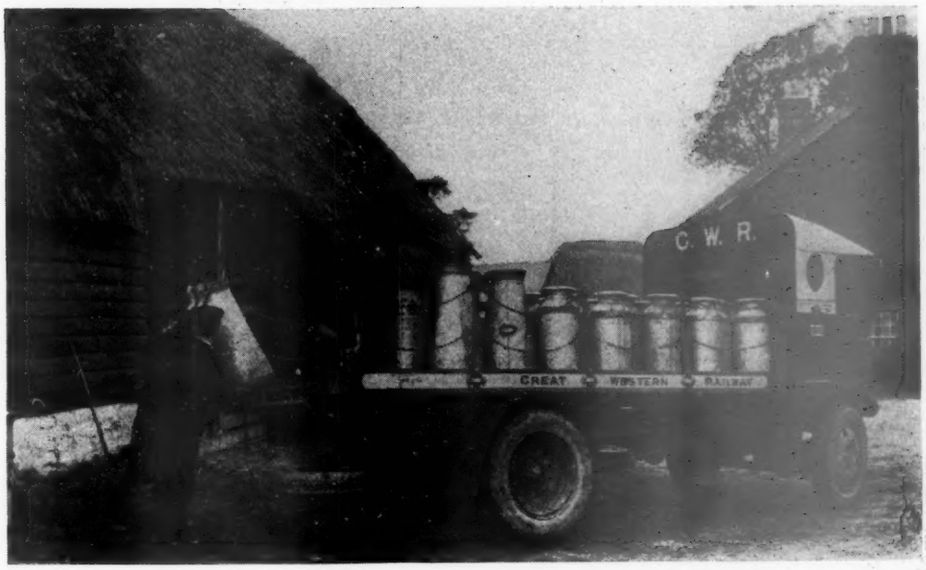
THE Stewart Motor Corporation, Buffalo, N. Y., is producing a new two-ton chassis, designated as Model 50X, which has a six-cylinder engine developing 65 hp. The bore and stroke of the engine are 3⅜ in. by 4½ in., respectively.

Among the features of the engine are pressure-feed lubrication, a removable cylinder head and removable block, bronze-backed crankshaft bearings, a down-draft carburetor equipped with an air cleaner, and Delco-Remy engine-driven distributor, generator and starter. The clutch is a single 11-in., dry-plate, equipped with a vibration dampener. The transmission, which is in unit with the power plant, has four speeds forward and one reverse.

The frame has pressed steel side rails, 7½ in. deep at the maximum. The front axle is of the I-beam type, and the front springs are 38½ in. long and 2¼ in. wide. The rear axle is of the truck type with single piece, heavy cast steel housing, and the rear springs are 50 in. long and 2½ in. wide. Four-wheel Bendix brakes are provided. Available wheelbases are 134 in., 145 in., 160 in. and 176 in.



The New Model 50X Stewart



Cartage of Milk Is a Regular Feature of the Farm Services, the Rate for Distances Up to Five Miles Being One Cent a Gallon, Including the Return of Empty Containers

British Road Offers Complete Service

With co-ordinated operations available no patron of the Great Western need own a motor truck

CO-ORDINATED rail and highway freight-handling operations of the Great Western of Great Britain have been developed into such a complete transportation service that it is now virtually unnecessary for any patron of this railway to own a highway motor truck. Except for strictly intra-plant work the entire transport job can be turned over to the Great Western and its co-ordinated facilities will be found adequate. The company has established railhead distribution centers and over-the-road trucking routes; it provides collection and delivery services in villages and at farms and engages in contract trucking; it has specially-constructed highway vehicles to handle special traffic; and enters contracts for the performance of the entire transportation work of industrial firms.

Transferring Milk Traffic at a Railway Station

The ramifications of these intensively-developed operations are evident when it is realized that more than 1,400 off-track villages and farming districts are served regularly by the so-called "Country Cartage Services," which involve store-door collection and delivery of all freight. This freight from the rural areas is either handled by highway in over-the-road trucking services or carried to concentration points for forwarding by rail. There are at present 142 of the concentration points or on-track stations from each of which motor trucks operate to villages and farms within a 20-mile radius.

Rate Structure Acme of Simplicity

The rate structure is extremely simple. It is based on weight and distance with no classification of commodities save a brief statement of exceptions as follows: "The rates quoted do not apply to heavy machinery or to articles of exceptional bulk in relation to weight such as agricultural implements, bales of feathers, light furniture, nor do they apply to such traffics as house hold removals, live stock, milk, coal or bricks." This does not mean, however, that the foregoing commodities are excluded from the highway services since the schedule states that "for such special traffics independent quotations will be made on application."

Two general schedules of rates are in effect—one for heavier loads involving minima of one, two and four long tons and the other for smaller shipments ranging from "not exceeding seven pounds" to a long ton of 2,240 lb. Slightly different rates are applicable at different groups of concentration points but one of

Delivery Direct to the Farm

the heavier-load schedules applies at 85 of the 142 stations and parcel rates are uniform at 132 stations.

For two-ton loads the trucking rate ranges from 2 shillings 6 pence, or 60 cents (British money converted to U. S. at par), per long ton for a one-mile haul to 15 shillings 6 pence, or $3.77, for a 20-mile haul. This is equivalent, respectively, to 2.7 cents per 100 lb. for one mile and 16.8 cents per 100 lb. for 20 miles. The latter averages 8.4 mills per 100 lb. per mile. When the minimum load is four long tons the rate per ton for the first mile remains the same but at 20 miles it becomes 11 shillings 6 pence, the equivalent of 12.4 cents per 100 lb., or 6.2 mills per 100 lb. per mile.

At the 132 stations to and from which the same rates apply on small parcels these charges range from six pence, or 12 cents, which is the charge for transporting a parcel "not exceeding 7 lb." a distance "not exceeding 3 miles," to 24 shillings, or $5.84, the rate on a 2,240-lb. load moving "over 15 and up to 20 miles." The seven pound parcel would be carried up to nine miles for the 12-cent rate and up to 20 miles for 14 cents. Rates are in fact uniform at 12 cents for the transportation of any parcel weighing up to 28 lb. a distance not exceeding nine miles and any parcel not exceeding 56 lb. in weight a distance not exceeding five miles. The 2,240-lb. load would be carried three miles for $1.09; up to five miles for $1.82 and 15 miles for £1 or $4.87..

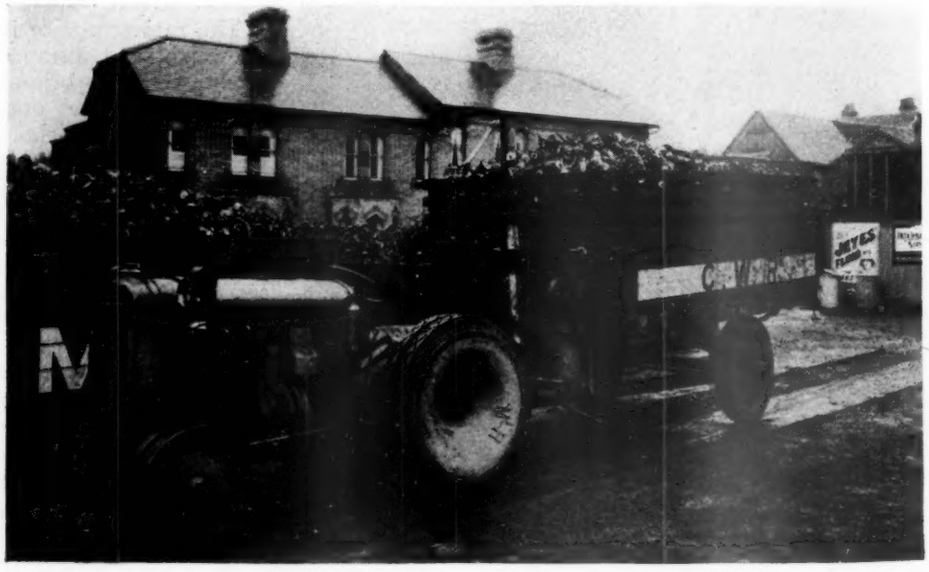
1,400 Villages Served Regularly, Others On Occasion

In addition to the regular services (at least twice a week) at the 1,400 villages on scheduled routes, collection and delivery service is also available at smaller communities when the occasion arises. These special journeys are not undertaken for less than reasonable truck loads and the rates for small consignments apply only where sufficient general traffic is available to justify the operation of a truck.

Services for farmers are given special attention. By utilizing them the farmer is able to assign his horses and equipment to more important work on the farm. The cartage of milk is a regular feature of the farm services; the rate for distances up to five miles is one cent a gallon, including the cartage of the empty containers. Specialized equipment for this agricultural traffic is provided. The transportation of sugar beets from farm to factory, for example, has been facilitated by the development of a highway vehicle specially designed for driving onto sugar beet fields.

Railhead Warehouse Distribution in Railway Trucks

Other co-ordinating services of the Great Western, as mentioned at the outset, were expanded when the road recently purchased 227 new motor vehicles for highway freight operations. The railhead distribution plan, the same as those operated by other British railways, has previously been described in the *Railway Age*. It involves the location at strategic points of railroad-owned warehouses served by railroad-owned trucks. Warehouse space is leased to shippers and the railroad performs all work in connection with the collection of accounts, the control of stocks and the execution of delivery orders. Some of the 227 new vehicles were to be specially built for handling loads of exceptional size and weight, others were to be assigned to special contract work on construction projects and still others were to be used in performing the entire transport work of firms. Thus, by rendering such complete transportation services, the Great Western is in a position to relieve its patrons of the need for maintaining those highway fleets which, once purchased by



Transportation of Sugar Beets from Farm to Factory Is Facilitated by the Use of This Vehicle, Specially Designed for Driving Onto Sugar Beet Fields

necessity for local service, are easily diverted into formidable competitors of the railways for long-haul freight traffic.

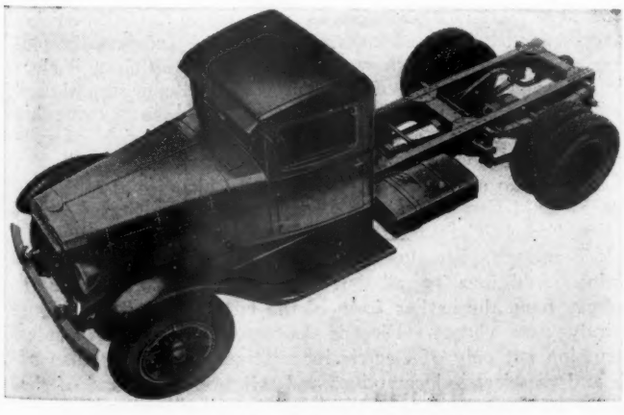
International Offers Two Five-Ton Trucks

TWO new six-cylinder motor trucks, each with a rated capacity of five tons, have been placed on the market by the International Harvester Company, Chicago. These are designated as Model A-7 and Model A-8, and are available in wheelbases of 160 in., 180 in., 200 in. and 225 in.

The engines are of the six-cylinder, valve-in-head type, the bore and stroke of Model A-7 being 4½ in. by 5½ in., respectively, and those of Model A-8, 5 in. by 5½ in., respectively. Model A-7 develops 107 brake hp. and Model A-8 develops 132 brake hp., at governed speeds of 1,800 r.p.m. for each unit. A feature of the engines is the removable cylinders. Other features are down-draft carburetion, a fuel pump, an oil-type air cleaner and thermostatically-controlled cooling. The clutch is of the single-plate type, and the transmission has five speeds forward and two reverse. There is a power take-off opening on each side of the transmission case. The frames are pressed steel channels, ⅜ in. thick and 12½ in. deep at the center and tapering to the front and rear.

Instead of two springs, there are four springs at the rear end. These are of the semi-elliptic type, one being mounted above the other below the rear axle on each side. Both upper and lower springs are attached at the front to a swivel-beam equalizer, which equalizes torque and driving stresses from the upper and lower springs when power is applied. This rear-spring construction is said to assure greater ability to absorb the torque and driving stresses of the rear axle, and to provide improved cushioning for the chassis and load. It also makes possible the use of extra large, heavy duty dual tires and an overall width on the road within 96 in.

The rear axles are of the full-floating, double-reduction type with spiral-bevel gears in the first reduction and herringbone gears for the second reduction. Both the new models are equipped with four-wheel service brakes. The front-wheel brakes are of the internal-expanding, self-energizing, shoe type with a vacuum-operated booster. The rear-wheel brakes are of the internal-expanding wrap-band type.



One of the New Five-Ton Internationals

The Indiana Model 95 Truck Chassis

New Series of Six-Cylinder Indiana Trucks

A NEW series of six-cylinder trucks, to be sold and serviced through the factory branch and dealer organization of the White Company, has been developed by the Indiana Motors Corporation, Marion, Ind. Known as the Model 95 series, the trucks will be available in 12,000, 15,000 and 20,000 lb. gross weight capacities. One model with a single reduction rear axle is designed for a load of 12,000 lb. and for high speed service. Another with a double reduction rear axle is designed for loads of 15,000 lb., and the two others are six-wheel units designed for loads of 20,000 lb. Five wheelbases, 132 in., 141 in., 155 in., 169 in., and 186 in. are available on the first two models, while the last two are to be had with two wheelbases.

The six-cylinder engine with which these models are equipped is of the L-head type and, with a bore of 3¾ in. and a stroke of 4¼ in., has a piston displacement of 282 cu. in. The engine develops 90 brake horsepower at 2,500 r.p.m. Other features of the power plant are full force feed lubrication to the main bearings, connecting rod bearings, camshaft bearings, and timing gear; water circulation by a centrifugal pump; aluminum-fitted pistons with four rings; helical timing gears with a ⅞-in. face; a balanced down-draft carburetor; and connecting rod bearings 2 in. in diameter and 1½ in. long. The clutch is a single plate 11 in. in diameter. The transmission is mounted in unit with the motor and has selective sliding gears with four speeds forward and one reverse.

Model 95 has a single-reduction, spiral-bevel-gear rear axle. The four-wheel internal expanding hydraulic brakes have a diameter of 16 in., and are 2¼ in. wide on the front wheels and 3½ in. wide on the rear wheels. The chassis weight of this model is 4,400 lb. Model 95-DR has a full-floating double reduction drive rear axle, and a chassis weight of 4,650 lb. Model 95-SBT-150 has a dual rear axle, the power being on the forward axle only. The weight is equally divided on both the rear axles. The hydraulic, internal-expanding foot brakes act on all six wheels, and are operated through a vacuum booster. The sizes are the same as on the other models. The chassis weight of this model is 5,500 lb. Model 95-SW-75 has a worm-drive, dual rear axle, with power on both axles. The brakes are the same as on Model 95-SBT-150. The chassis weight is 5,800 lb.

Communications and Books . . .

"Keep on Hammering"

NEW YORK.

TO THE EDITOR:

Referring to your leading editorial of February 20, "Responses to the Call for Volunteers": Please keep on hammering. Unity of leadership is the primary requisite. With it, we can regain our former position. Without it, we are sunk.

The writer, as a citizen, for years has endeavored to convince legislators, governors, congressmen, senators and other public officials of the need for more fair treatment of the carriers, and of the great dangers of increasing taxation. He will continue to do so.

The darkest hour is just before the dawn. Keep on keeping on.

H. E. CARTWRIGHT,

Assistant to Vice-President, Railway Express Agency.

Trucker Presses Shipper's Pants as Premium For Patronage

TO THE EDITOR:

Having attended numerous truck hearings before the Texas Railroad Commission, I find that one of the main reasons why merchants of the smaller towns prefer trucks to railroads is the personal service phase.

For example, at a recent hearing, a truck applicant had five merchants from a small town as witnesses in his favor. One of the merchants on being examined as to a specific reason why he preferred truck service, said: "I had the trucker take a suit of clothes to the city to be cleaned and pressed."

The railroad has daily service to and from the town in question, while the trucker operates only twice a week—still the trucker gets 95 per cent of the business from the city to this town, notwithstanding that under the Texas law the same rate is *supposed* to be charged by the trucker as by the railway, and the railway has store door collection and delivery.

G. S. MCLELLAN,

General Transportation Inspector, A. T. & S. F.

How Purchasing Agents Can Stimulate Railroad Traffic

ATLANTA, GA.

TO THE EDITOR:

A great deal has been said and written during recent months about ways and means that might be employed by our railroads in regaining lost freight. Not only are officers and employees of our railway systems vitally interested in this subject, but it is close to the pocketbook of every railroad security holder. The new forms of competition now encountered by the railroads not only endanger earnings of the railroads themselves, but they have an important bearing on the economic well-being of our entire industrial set-up.

It occurs to me that the railroads are overlooking some wonderful and very practical opportunities. They are waging well their fight against trucks operating over state maintained highways. However, this is a collective fight that is not being supported by the individual railroad as well as it should be. As a matter of fact, practically every railroad is encouraging and throwing traffic to other forms of transportation through their purchasing departments.

It actually works out like this: Wherever an individual railroad wishes to make a purchase, its purchasing department buys from the concern offering the lowest prices based of course on quality, etc., being the same, and the railroad is not interested in any way as to how the supplier of the order will assemble his raw material.

For instance, suppose a railroad wishes to purchase rails and wheels. The raw material, that is the iron ore, might be transported to the plant manufacturing the rails and wheels by barge or truck. In some cases the railroad will even accept delivery of the finished product by truck or barge.

Of the total dollar value of supplies purchased by industry, one-sixth is bought by the railroads. Therefore, it is quickly apparent that they could create a vast amount of additional business for themselves if each railroad would incorporate in its purchase orders, contracts, etc., this clause:

"All materials furnished on this order are to be assembled by the manufacturer at his plant by rail."

I understand that such a requirement would not conflict in any way with any of the regulations under which the railroads operate. In fact, experience has proven that this can be done without difficulty.

This idea was carried out in the purchase of materials for the Cincinnati Union Terminal, a joint project of the railroads and the City of Cincinnati, and its possibilities can be realized easily if we check upon the large amount of materials and supplies involved in the construction of that magnificent property.

It is high time the railway systems of our country helped themselves and the country back to normal prosperity by taking full advantage of the tremendous revenue possibilities inherent in this method of purchasing materials and supplies.

ELIAS C. LYNDON.

New Book

Trains, Tracks and Travel (Third Edition), by T. W. Van Metre, Professor of Transportation, Columbia University. 265 pages, 9¼ in. by 6½ in. Illustrated. Bound in cloth. Published by Simmons-Boardman Publishing Company, 30 Church St., New York. Price, $3.

Professor Van Metre's justly-popular book, originally brought out by its present publishers in 1926 and reprinted in 1927, has now been issued in its third edition. Although somewhat revised, enlarged in scope and brought strictly up to date, the work in its present form embodies all the desirable characteristics which made the two earlier editions enjoyable and profitable reading for "boys from eight to eighty."

Chief among those characteristics is the use of simple, non-technical language, readily intelligible to the average boy or to the average layman, to review railroad history, and to describe track, locomotives, cars, terminals and train operation. Yet despite this absence of many of the scientific terms frequently employed in writing about railroads, the book is accurate and technically correct; and it does not give the impression of "talking down" to its readers. All important details of railroading are included, but confusing non-essentials are wisely omitted. Much of the story is told, too, by illustrations, which are scattered liberally throughout the volume, reproductions of some 20 or more new photographs appearing in the third edition to supplement those used in earlier printings. Incidentally, pictures of a Delaware, Lackawanna & Western multiple-unit electric suburban train and of Germany's new "Zeppelin rail-car" testify to the care which the author has used, in revising his work, to incorporate the latest developments in the field of railway transportation.

Like the two previous editions, the third includes chapters on Our Steam Railroads, The Railroad Track, The Steam Locomotive, Freight Cars, Passenger Train Cars, Passenger Stations and Terminals, Freight Terminals, and The Operation of Trains. Additions to all but one of these chapters mark changes from the earlier form of the book, while there is one entirely new chapter—Electric Locomotives—which includes discussion not only of electric locomotives proper, but also of oil- and gas-electric locomotives and rail motor cars and of the history and extent of railroad electrification in general.

Odds and Ends . . .

Do They Take Old Razor Blades?

The problem of what to do with antique railroad equipment has been solved by the Chicago & North Western, which presented a collection of obsolete railroad material to the Museum of Science and Industry in Chicago.

He Deserves a Refund with Interest

A 50-cent piece, produced from his own pocket and quickly inserted and fastened in a broken air brake pipe to blank the air line, was used by Charles M. Crowther, machinist in the Meadows shop in the New York zone of the Pennsylvania, to get Train A-6 on its way recently, after it had stalled on the Perth Amboy and Woodbridge branch.

Can any of our readers supply stories of other instances of such rough and ready first-aid to ailing trains or other railroad equipment?

A Rate for Moving the Dead

An unusual rate was proposed by the Santa Fe recently. It was to apply in connection with the movement of the national cemetery at Ft. Apache, near McNary, Ariz., to Santa Fe, N. M. With a view to simplifying the bill of lading requirements in connection with the movement, the Santa Fe asked the commission for permission to publish a rate of $225 a car on "human remains in steel boxes, human bones in boxes, and grave monuments in straight or mixed carloads" from McNary to Santa Fe.

Still the Champion Oyster Eater

At the fifth annual oyster dinner given recently by the perishable freight department of the Louisville & Nashville at Louisville, Ky., S. Weatherly, superintendent of perishable freight, successfully defended the oyster-eating championship which he has held for five years. Although a game fight was put up by the six challengers, Mr. Weatherly did not have to extend himself to win. You might say he won in a gulp. It was estimated that he consumed about 200 of the bivalves, but he disposed of them so rapidly that an accurate count was impossible.

Is Part-Time Work a Blessing?

Is it possible that we have been wasting sympathy on railroad shop employees, many of whom have been working only part time for some months? A new slant on their predicament was thrown by a writer in the Topeka "Capital" recently. It was in a story about the splendidly equipped gymnasium which the Santa Fe has provided for its employees at Topeka, Kan., that he said, "The shop workers have more time (to spend in the gymnasium) than the office workers do, because they are only working four days a week, which leaves Friday and Saturday free for their sports."

Women in Railroading

It has been our observation—a somewhat regretful observation, incidentally—that virtually all the secretaries of railroad officers are of the so-called stronger sex. Every rule has its exceptions, however, and there are two notable exceptions to the male-secretary rule in the general offices of the St. Louis-San Francisco at St. Louis. Here, fair secretaries adorn the offices of two of the executives. Miss Rose Resnick is private secretary to J. R. Koontz, vice-president in charge of traffic, and Miss Ella Ecklekamp holds a similar position in the office of L. O. Williams, secretary and treasurer.

"Snowball Specials"

When Southern Pacific men talk about their "Snowball Specials," they are not referring to high speed trains of refrigerator cars or any other variation of the well-known "redball" trains. "Snowball Specials" on the Southern Pacific are the special passenger trains they have been running during the past winter to Lake Tahoe, which is a center of winter sports activities. The Southern Pacific has made a very good thing out of these "Snowball Specials" this winter, with the help of the National Ski Tournament which was held at Lake Tahoe the other day, and with the help also of exceptionally good snow conditions.

Signaling Practice in Germany

The German railways are to put a double passenger car, capable of a sustained speed of over 93 miles an hour, in service between Berlin and Hamburg next summer. With the establishment of the summer schedule, the maximum speed of the non-stop trains on this run will be increased from 68⅓ miles an hour to 74½ miles an hour. Prospective passengers need not be apprehensive of such speed, however, since the railways, with true German thoroughness, are increasing the distance from the first cautionary signal to the stop signal from 700 to 1,200 meters. This is to give the brakes on the car time to act. At those speeds, they will need it.

Another Frisco Industry?

A novel solution to the old problem of what to do after you have been retired on pension was decided upon by A. B. Cox, former agent of the St. Louis-San Francisco at Sarcoxie, Mo. Having attained the age of 70, Mr. Cox retired on January 1 of this year, and he is now devoting his entire time to strawberry growing, an occupation which he had followed only in his spare time previous to his retirement. That Mr. Cox is no mean strawberry grower is indicated by the fact that he raises approximately 200 crates of strawberries to an acre on his farm. It will certainly be a stunning blow to the Frisco if this particular shipper is won over to patronage of the motor truck lines.

The Younger Generation Is Always Surprising

It is traditional, of course, that children hate to go to school. Yet Dr. J. B. MacDougall of the Ontario Department of Education is the authority for a story which proves how popular the school cars, operated by the Canadian Pacific, are with the children in the sparsely settled districts of Northern Ontario. Two children in this region, aged 7 and 9, whose mother had died and whose father had gone back to his trap lines around Hudson's Bay, were so keen in their desire to attend the school that they mushed 40 miles with a dog team, pitched their tent in 5 ft. of snow in a spruce forest, supported themselves by trapping and attended school all through the winter on the 5 days of each month when the school car was in their neighborhood. Even when the temperature was 50 deg. below zero, they did not miss a day.

Advertising Pays

Not long ago we told what a favorable impression the exhibit of Pullman sleeping accommodations, situated in the Pennsylvania Station in New York, made upon an inebriated gentleman who wandered into the station one night and went to sleep in one of the berths. Here is another story about this exhibit, which we have just heard. Two days after the exhibit had been placed in position, it attracted the attention of a well-known opera singer, who presented herself to the official in charge shortly afterwards and startled him somewhat by asking the cost of reserving for herself and her accompanist one of the double-berth rooms in each direction between New York and Cleveland, not merely for one round trip, but for weekly round trips for 20 consecutive weeks. After a little figuring, the necessary reservations were made and a check for something like $2,500 was paid for the accommodations. It just goes to show how handsomely advertising pays.

NEWS

I. C. C. Denies Fourth-Section Relief to S. P.

Finds proposed rates, competitive with Panama canal, "not compensatory"

The Interstate Commerce Commission has denied the application of the Southern Pacific lines for fourth-section authority to establish reduced rates between their California terminals and related inland points and their Atlantic seaboard piers over their Sunset-Gulf ocean-and-rail route through Galveston or Houston, Tex., on carload traffic competitive with intercoastal steamship lines operating through the Panama canal, without making corresponding reductions to intermediate points in California, Arizona, New Mexico, and Texas. Examiner W. A. Disque, in a proposed report, had recommended that the application be granted.

"On this record we have not been persuaded," the commission said, "that, as a whole, the rates proposed by the applicants would be reasonably compensatory. Such rates as we would feel justified in approving as compensatory would be much too high to attract any substantial volume of this traffic to the Sunset-Gulf route. Even as to the few items on which the level of the proposed rates might possibly be approved, the volume of business would not be consequential and a slight reduction in the rates through the canal would either eliminate the competition of the Sunset-Gulf route or require applicants to reduce their rates still further." The commission also said that there is no doubt that such additional traffic as the applicants might be expected to obtain under the proposed rates could be handled at much less expense per unit than the average cost of handling present traffic but that the record is not convincing that any substantial volume of added traffic could be handled without an increase in train miles.

Commissioner Mahaffie, dissenting, said that the report shows that the Sunset-Gulf route has lost to the canal lines practically all the transcontinental traffic it formerly handled and for which the route was established. "Its existence is threatened," he said. "It ought to be allowed to live if it can. It performs a desirable transportation service. In my opinion relief from the fourth section should be granted subject to a limitation as to earnings of 5 mills per ton-mile and 10 cents per car-mile, based on reasonable minima." Five of the commissioners, Porter, Eastman, Lewis, McManamy, and Lee, wrote concurring opinions explaining their votes, and Commissioner Farrell joined in Commissioner Lewis' expression. Commissioner Eastman said that the facts strongly suggest "that the rail lines have more to gain by encouraging and developing their traffic between interior points and the ports, in connection with the water lines, than they have to gain by diverting traffic from the water lines through the medium of super-thin relief rates."

Freight Traffic in January

Freight traffic moved by the Class I railroads in January amounted to 22,859,886,000 net ton-miles, according to reports compiled by the Bureau of Railway Economics. Compared with January, 1931, this was a reduction of 7,448,318,000 net ton-miles, or 24.6 per cent, and of 13,857,876,000 net ton-miles, or 37.7 per cent, under January, 1930.

In the Eastern District, the January total showed a reduction of 23.9 per cent compared with the same month in 1931; the Southern showed 26.2 per cent, and the Western 25 per cent.

Ohio Shippers Favor Repeal of Section 15-A

A resolution, recommending the repeal of Section 15-A of the Transportation Act, was adopted by the Ohio Valley Shippers' Advisory Board at its meeting at Columbus, Ohio, on March 15. Another resolution adopted by the board disapproved the proposed report of Director of Service William P. Bartel and Examiner John L. Rogers in the matter of reciprocity in purchasing and routing, which recommended legislation taking away from shippers their right to route their freight.

Reports of commodity committees showed that 512,000 cars will be needed to move the traffic anticipated during the second quarter of the year, representing a decrease of 7 per cent, as compared with the first quarter of 1932. The only commodities the shipments of which are expected to increase, were sand, gravel, stone and lumber, for which the increase was estimated at five per cent.

J. F. Deasy, vice-president of the Pennsylvania, speaking at the meeting urged that users of highways be required to pay the cost of railroad grade crossing eliminations. He said that crossing elimination work had cost the railroads $203,000,000 in the 10 years beginning with 1920, and argued that the highways, to a great extent, are used by competitors of the railroads and that crossing eliminations did not add one cent to the earnings or profits of the roads.

N. Y. Truck Tax Boost Falls Short of Goal

Charging intra-city vehicles same rate as users of rural roads arouses strong opposition

Failure to exempt intra-city operators, whose vehicles make but little if any use of the state highways, from the increased taxation provisions of proposed amendments to the New York laws governing motor vehicles for hire crystalized an opposition to the measure which was able to limit the new legislation to a deferred and temporary increase of 65 per cent in the existing rates. Since vehicles operating for hire in New York have been, of all those in the United States, among the most favored by low registration and gasoline taxes the amended law, effective for only 18 months, falls far short of the hopes of those who sought to bring some measure of equity into the competitive of rail and highway carriers.

That it was the failure to recognize the fundamental distinction for taxation purposes between intra-city and inter-city operations which caused the downfall of bill as originally drawn is evident from the identity of the last-minute opposition whose amendments rendered abortive the whole movement. A New York Times legislative correspondent called this eleventh-hour opposition "the strongest and most effective lobby that has operated on Capitol hill for a dozen years or more." He identified the lobbyists as representing "trucking companies, bus corporations and contractors in New York City."

The opposition succeeded in reducing the measure to an emergency revenue bill of mild proportions. It preserved the existing net weight unladen basis as against the gross weight basis in the proposed assessment scales and, in lieu of the materially increased rates per 100 lb. of gross weight proposed for heavy vehicles, there was left only the 65 per cent increase in the already existing low rates on the net weight basis.

With the exception of other minor matters the new legislation as finally enacted consists merely of a new section in the vehicle laws headed "Temporary increase of registration fees for auto trucks and omnibuses" and containing the blanket 65 per cent increase provision. The section becomes effective July 1 and is operative until December 31, 1933. In the case of registrations to expire December 31, 1932, however, the increased taxes do not become effective until March

(*Continued on page 545*)

Ohio R. R. Employees Fight for Fair Play

Form League to promote equal treatment for all forms of transport

Railroad employees and others of kindred interests in Ohio have organized "The Ohio Railroad Employees and Citizens League," the purpose of which is to "seek legislative backing on a plan to equalize all forms of transport." Membership is solicited among railroad employees and all other persons who realize the economic importance of remedying the present chaotic transport situation. No dues are charged, and expenses are met entirely from voluntary contributions which have ranged from ten cents to a few dollars.

Membership is growing rapidly. In the Portsmouth, Ohio, area 15,000 members have been enrolled and in the Columbus and Cincinnati districts membership totals over 20,000 each. A membership of over 100,000 is expected within a relatively short time.

The association has petitioned Congress in favor of S. 2793, Senator Couzens' motor transport regulation bill, H.R. 7239, Representative Huddleston's motor transport regulation bill, and H.R. 7246, Representative Boland's motor transport tax bill. Copies of the petition have been addressed not only to the chairmen of the interested Congressional committees but to Ohio's senators and representatives as well. The petition took the form of a brief setting forth in considerable detail the underlying economic principles of the present transport situation.

The league emphasizes that it is not antagonistic to highway transport as such and recognizes that it has a legitimate field in which it is the most economic and convenient method; but the new agency should not be artificially extended into a field where it does not belong by inadequate taxation and favored regulatory treatment.

H. O. Hewitt, P. O. Box 114, Portsmouth, Ohio, is president of the league.

Signal Section at Chicago May 10

The Signal Section of the American Railway Association, as heretofore announced, will hold its thirty-eighth annual meeting at Chicago on May 10 and 11. The first session will begin on Tuesday at 9:30 a.m. Central daylight saving time.

Secretary R. H. C. Balliet has issued the advance notice of the meeting, a pamphlet of 378 pages, filled with the subjects to be discussed. The Committee on Economics of Railway Signaling will present the usual variety of interesting matter, including some memoranda concerning the cost of construction of railroads in 1831-35, 1839, 1843, 1865, etc. The report of the Committee on Instructions, which deals with batteries, interlockings, interlocking circuits, etc., fills 187 pages.

Federal Government to Intervene in Railroad Receivership

United States District Judge Faris at St. Louis, Mo., has granted the federal government leave to file an intervening petition in the 17-year old receivership of the old Missouri, Kansas & Texas Railway Company. The government is attempting to collect an alleged deficiency of $580,575 in income taxes for 1920. The suit is directed by the commissioner of Internal Revenue against Charles E. Schaff, who in 1915 was appointed receiver for the railroad company and is still technically acting in that capacity. Judge Faris will hear the plea to intervene on April 4. Counsel for the railroad contended that the statute of limitations barred intervention in the old receivership. In 1922, the properties of the Missouri, Kansas & Texas Railway Company were turned over to the successor company, the Missouri-Kansas-Texas. The old company has no assets.

Traffic Clubs to Meet at St. Paul

The Associated Traffic Clubs of America will hold its semi-annual meeting at the Lowry Hotel, St. Paul, Minn., on April 27 and 28.

Anti-Injunction Bill Signed

President Hoover, on March 23, signed the anti-injunction bill on which a conference report was agreed to last week by the Senate and House of Representatives.

Petroleum Rates Postponed

The Interstate Commerce Commission, at the request of the carriers, has postponed from April 15 to July 14 the effective date of its order prescribing a general revision of rates on refined petroleum products in the Southwest.

Hearing on Northern Pacific A. T. C. Petition

The Interstate Commerce Commission has re-opened its automatic train control proceeding for the purpose of further hearing to give the Northern Pacific an opportunity to submit evidence in support of its petition for relief from the commission's requirements as to the continued maintenance of automatic train control on its line between Mandan, N. D., and Glendive, Mont.

Ferry-Truck Rates Found Not Unlawful

The Interstate Commerce Commission has issued a supplemental report on its investigation of container service, finding that the ferry-truck rates and charges of the Chicago, North Shore & Milwaukee Railroad between Chicago and Milwaukee and Racine, Wis., have not been shown to be unlawful. The Chicago & North Western, which had canceled its container service following the issuance of the commission's order, had petitioned the commission to require the North Shore to conform its rates and practices to the order in the container case.

Motor Mfrs. Myopic, Eysmans Declares

Promote unhealthy activity in truck market, neglect constructive future plans

The menace of unrestricted and unregulated highway and waterway competition from the standpoint of the business public and responsible motor vehicle and waterway interests as well as from that of the railways was discussed by Julien L. Eysmans, vice-president of the Pennsylvania in a recent address before the Manufacturers' Association Traffic Club of Lancaster, Pa. After stressing the importance of this new competitive situation with which the railroads are faced, Mr. Eysmans outlined the need for federal regulation of motor vehicles in order to cope with the present problem for the solution of which state regulatory laws have been found inadequate.

Extracts from the address follow:

The competition of highway and water transport which has grown up against the railroads is almost entirely unrestricted and uncontrolled, and has reintroduced into the transportation picture the disturbing and unstabilizing element of competition in rates. Moreover, the competition is not upon fair and equitable terms. The railroads are regulated as to almost every detail of their affairs while the agencies of highway and water transport are practically free from effective governmental regulation with respect to their rates, practices, character of service, acceptance of business, and similar matters.

State laws are for the most part ineffective, and will continue to be, until the Federal government assumes regulative power over interstate highway transportation. This was the experience in the case of the railroads.

Far from being harmful to legitimate highway transportation, proper regulation is an absolute essential to placing that industry upon a sound, substantial, economic basis. With all its errors, regulation rescued the railroads from rate wars, from secret rate cutting, from depletion of revenues by rebates, and from competitive over-building and over-extension of facilities. It will do the same thing for highway transport.

It would be an exceedingly wise and shrewd move for the legitimate truck and bus interests of the country to unite now not merely in submitting to, but in demanding, a constructive, just and economically sound plan of federal regulation.

It is a matter of great regret to me that the automotive manufacturing interests of the country have not seen fit affirmatively to endorse such a procedure, but instead have, as I believe against their own best interests, apparently chosen to concentrate upon seizing what advantage they may from an unhealthily active market for trucks which, in the nature of things, cannot last.

It is unfortunate that the attitude of

the railroads toward the regulation of highway transport should at times be misunderstood. The railroads do not advocate making highway transport artificially expensive in order to return traffic to the rails. We concede the public's right to select the agency of transportation which it wants and finds most useful. All we ask is that when we are called upon to face greatly increased rivalry, and upon a scale which a few years ago would have seemed impossible, there shall be a fair field and no favor.

In asking for what they believe to be justice, the railroads are well aware that they cannot sustain their plea merely upon sentimental grounds. We are dealing with a question of hard economics. The economic reasons for protecting the railroads from competition which is unjust, unfair, or unequal is that a very large part of the service which they render is indispensable to the country and will continue so for many years to come. Therefore, the country cannot afford to permit unfair competition to impair the capacity of the railroads for rendering essential and irreplaceable service.

Years ago this country learned one of its great lessons. It was that if business is to function properly, transportation rates must answer four tests. They must be reasonable; they must be nondiscriminatory; they must be stable; they must be published and maintained. To make forward commitments safely, business men must know what their own transportation costs and those of their competitors, are going to be.

For more than a quarter of a century railroad rates have met these requirements. The resulting advantage to industry and commerce has been beyond estimate. But now the unregulated truck, varying its rates at will, with no obligation to publish and maintain its rates, with no duty to charge like rates for like service, is rapidly bringing back the old evils of secret rates, discrimination and rebates.

A very curious situation has come to our attention recently. In spite of the fact that freight traffic is down 40 per cent or more from what might be called normal, our agents and rate rooms have for some time been noticing an unusually large volume of calls for information as to rates between given points. This information we are of course required by law to give to anyone and without question. However, we are satisfied that at least a large proportion of these additional calls are simply inquiries, either on the part of a trucker or a truck patron, for data as to railroad charges, which then serve as a basis for arriving at the rate to be charged on a shipment made by truck. In other words, the railroad is, in substance, maintaining a tariff bureau for its competitor—the trucking industry.

We have no thought that the farmer's truck or the privately owned and operated trucks of industries, not utilized in commercial transportation, should be subject to regulation, other than that which is inherent in the police powers of the state, in the interest of safety or similar considerations.

Commercial vehicles operated for hire, whether as common carriers or contract carriers, are in a different class. We think they should be regulated as to their rates, practices, accounting, working conditions, etc., in a manner appropriate to the character of the services rendered, relying for guidance largely upon the wealth of experience which this country has gained in regulating railroads.

We believe that the regulative authority, as to interstate service, should be the Interstate Commerce Commission, supplemented and supported by proper intrastate regulation in every commonwealth.

Fair, properly conducted, constructive and equitable regulation of all forms of service would help each agency find its proper place in the general distribution system, give the country as a whole a greatly reduced transportation bill, eliminate many uncertainties from the conduct of business, place transportation itself upon a sound and healthy basis, and enable well-managed transport enterprises, both large and small, to sustain their credit and earn reasonable returns in the public service.

Freight Rates on Paper Postponed

The Interstate Commerce Commission has suspended from March 20, until October 20, the operation of tariff schedules which propose a readjustment of rates on paper between points in Illinois, upper peninsula of Michigan, Minnesota, Wisconsin, and other Western Trunk Line points, to meet purported motor truck competition, which results in numerous reductions.

Highest Court to Review Status of Piedmont & Northern

The Supreme Court of the United States has granted the petition of the Piedmont & Northern for a review of the decision of the district court for the western district of South Carolina, which had enjoined the company from proceeding with the construction of extensions of its electric line until it receives a certificate from the Interstate Commerce Commission.

I.C.C. Orders Increase in Illinois Intrastate Coal Rates

An upward revision of rates on coal for intrastate traffic in Illinois was prescribed by the Interstate Commerce Commission in a report made public this week, based on a finding that rates ordered by the Illinois Commerce Commission resulted in unjust discrimination against interstate commerce. The commission also prescribed some changes in certain interstate rates to Illinois points.

Club Meetings

The Southeast Shippers' Advisory Board will hold its next meeting at Hotel Patten, Chattanooga, Tenn., on Thursday, March 31.

The Eastern Car Foreman's Association will hold its next meeting on the evening of April 22 at 29 West 39th Street, New York City. B. E. Miller (D. L. & W.), will present a paper on painting of steel passenger cars.

The New York Railroad Club will hold its next meeting at the Engineering Societies' Building, 29 West 39th Street, New York City, on Friday evening, April 15. C. A. Gill, chief consulting engineer of the Russian railroad system, will relate some of his experiences in Russia.

The Toronto (Ontario) Railway Club will hold its next meeting at the Royal York Hotel on Monday evening, April 4. The speaker will be Otto S. Beyer, consulting engineer of the American Federation of Labor. This meeting will be "Ladies' night" and will include a dance and entertainment.

Depreciation Order Postponed

As briefly reported in last week's issue the Interstate Commerce Commission on March 17 announced a postponement for one year of the effective dates of its order of July 28, 1931, requiring the railroads to put into effect on January 1, 1933, a complete system of depreciation accounting and to file by September 1 estimates of the percentage depreciation rates applicable to various classes of property. At the same time the commission postponed for a year the effective dates of its order as to telephone companies, under which percentage rates prescribed by the commission were to have been made effective on January 1 next.

The Presidents' Conference Committee on Federal Valuation of Railroads had asked for the postponement for at least a year, on the ground that the order makes a radical change in present accounting methods, the results of which as to expenses and income are not known; and that a substantial increase in expenses would be required to obtain the information necessary to make the order effective.

Safety Program for April

L. G. Bentley, chairman of the committee on education, has issued circular No. 320 of the Safety Section, A. R. A., proposing that safety committees in the month of April shall put special emphasis on the section foreman and his gang. The track gang is the foundation of railroad safety. The firmness of this foundation is established by the frame of mind of those who direct the building of the foundation. The foreman must not only maintain safe track but must recognize his responsibility for building and maintaining safe men. The foreman cannot of course always be watching each individual and therefore his specific problem is to establish in the mind of each member of his force the firm conviction that safety is to him a personal matter.

The circular contains a half dozen pictures illustrating right ways and wrong ways of performing typical track-work operations. Attention is called also to the fact that some railroads allow the foreman making a sufficiently good record to placard his tool house "No Accidents This Year." Others furnish a metal tag to be attached to a track motor car which has been handled with

creditable safety. On many railroads the foreman who has made a clear record has a "merit card" which he can always carry in his pocket.

Barge Line Service Authorized

The Interstate Commerce Commission has issued to the American Barge Line Company a certificate covering operation of barges on the Ohio river between Pittsburgh, Pa., and Cairo, Ill., including intermediate ports, and between Pittsburgh and ports on the Mississippi south of Cairo. It has also issued an order requiring the railroads to join with the barge line in establishing through routes and joint rates between certain points in Official territory and Ohio and Mississippi river ports and interior points in the Southwest.

The commission has also issued a certificate to the Mississippi Valley Barge Line Company authorizing it to extend its service to include that part of the Mississippi river between Cairo and St. Louis and an order requiring the railroads to join in rates and routes. Commissioner Mahaffie dissented in both cases because the commission had required the use of a constructive distance of 240 miles from St. Louis to Cincinnati in figuring the joint rates whereas the shortest rail distance for the transportation of freight between those points via Cairo is 497.7 miles.

Memorial to Arthur J. Wood

A movement has been initiated among mechanical-engineering graduates of the Pennsylvania State College to have the mechanical-engineering laboratory at that institution named the "Arthur J. Wood Memorial Laboratory" in honor of the late head of the mechanical-engineering department who was noted for his engineering work for railroads. Professor Wood died on April 18, 1931, after having been struck by a motorcycle. For four years prior to 1900 he was on the staff of the Railroad Gazette, predecessor to the *Railway Age*. Before his appointment as head of the mechanical engineering department he held the chair of railway mechanical engineering. Professor Wood served also as consulting engineer for railroads and engineering companies and he was the author of several books on locomotive performance and operation, and subjects related to refrigeration, as well as numerous articles and papers on these subjects.

The main portion of the laboratory which it is proposed to name as a memorial is completed and in service. Two wings are still to be erected and equipped. Much of the equipment pertains to railway-mechanical engineering and refrigeration subjects.

To impress the college trustee committee which has the naming of buildings in charge, engineers and others in the railroad industry, who knew Professor Wood and his work are requested to express their views on the memorial proposal in letters to T. C. McBride, chairman, Railroad division, American Society of Mechanical Engineers, care of the Worthington Pump & Machinery Corporation, Philadelphia, Pa., or to David L. Fiske, executive secretary, American Society of Refrigerating Engineers, 37 West Thirty-Ninth Street, New York. These letters will be bound in book form and presented to the trustee committee.

Railroad Payroll Reduced $813,000,000 in Two Years

The total railroad payroll for 1931 was $813,687,403 below that for the year 1929, and the number of employees in December, 1931, was 625,625 less than the number in the peak month of August, 1929, according to a summary of railway wage statistics for the year issued by the Interstate Commerce Commission, based on a consolidation of the twelve monthly summaries for the year.

The average number of employees for 1931, based on the twelve monthly counts, was 1,278,175, a decrease of 232,513, or 15.39 per cent, compared with the number for 1930 and a decrease of 408,594, or 24.2 per cent, as compared with 1929. The number for December, 1931, was 199,892 less than that for January, 1931, and 471,157 less than that for December, 1929.

The total compensation for 1931 was $2,127,181,287, a reduction of $463,093,556 below that for 1930. The number of hours (straight time actually worked plus overtime paid for) for the year divided by the average number of persons reported as employed at the middle of each month was 2,298 for 1931, compared with 2,511 for 1929. This comparison does not take into consideration those furloughed employees not represented among the employees in the mid-month count.

Great Northern Acquires Interest in Pacific Greyhound

Through a subsidiary, the Dakota & Great Northern Townsite Co., the Great Northern has acquired 70,000 shares of the common stock of the Pacific Greyhound Corporation. This represents an interest of 6-2/3 per cent. The Pacific Greyhound Corporation owns the entire capital stock of the Pacific Greyhound Lines, which operates an extensive system of motor coach lines in Oregon, California, Nevada, Arizona and New Mexico.

Previously the Southern Pacific was the only railroad holding any of the stock of the Pacific Greyhound Corporation. Following the merger of the Southern Pacific's bus operations with those of the other principal operators on the Pacific Coast and the formation of the Pacific Greyhound Lines, the Southern Pacific acquired a one-third interest in the holding company. The majority of the stock was held by the Greyhound Corporation, which has sold a part of its interest to the Great Northern. At the present time the Greyhound Corporation owns one-half of the Pacific Greyhound Corporation common stock, the Southern Pacific one-third and the Great Northern one-sixth.

The Great Northern is also interested in another unit in the Greyhound bus system holding one-third of the stock of the Northland Greyhound Lines which operate largely in Great Northern territory, and which, several years ago, took over the bus operations of the Great Northern's subsidiary, the Northland Transportation Company.

Railroad Y.M.C.A. Building Dedicated

The new Grand Central Railroad Y.M.C.A. building on Forty-seventh street in New York City, which serves the employees of the New York Central, the New York, New Haven & Hartford and other transportation interests in the Grand Central area, was formally dedicated on the evening of March 17. This building replaces the one formerly located on Park Avenue, which was torn down to make way for the new Waldorf-Astoria Hotel.

The basement of the new building is used for recreation features, including a swimming pool donated by Harold S. Vanderbilt. The first floor includes the offices, restaurant and dining rooms, a large lounge and a small chapel. The second floor includes a combination gymnasium and auditorium, a library, educational classrooms and clubrooms. The seven upper floors include 470 sleeping rooms, nearly all singles. The roof will be utilized for the erection of handball courts.

Vice-President John G. Walber of the New York Central, presided at the dedication ceremonies. Addresses were made by Dr. John R. Mott, Vice-President Richard E. Dougherty of the New York Central, and Ward W. Adair, the secretary of the association.

B. & M. Harvard Summer School Alumni Association

During the past four summers 24 representatives of the Boston & Maine have attended the transportation section of the special sessions of the Harvard Graduate School of Business Administration. The transportation courses have been given by William J. Cunningham, James J. Hill Professor of Transportation at Harvard University, and Winthrop M. Daniels, Thomas DeWitt Cuyler Professor of Transportation at Yale University.

During the past two years those who have attended the summer school from the Boston & Maine have formed an alumni association, with the expectation of following up their studies in such a way as to be of constructive assistance to the railroad. Six committees, for instance, have been appointed to do certain research work. These committees cover the following topics: Economies of freight train operation; storedoor pick-up and delivery by the railroads; passenger transportation developments; consolidation of Railway Express Agency and Boston & Maine forces at local stations, and utilization of the Railway Express Agency to deliver and collect l.c.l.; possibility of arranging local and through freight service so that power may be used in such a way as to avoid additional terminal time; long range planning in the use of motive power.

On Monday evening, March 21, the group held its annual Get-Together Dinner, inviting as its guests the department heads of the railroad and representatives of the New York, New

Haven & Hartford who had taken the summer school courses. I. C. Blodgett as chairman of the alumni association, presided at the dinner. Roy V. Wright, managing editor of the *Railway Age*, made the address, directing attention to the radical changes which are taking place in the field of economics and pointing out some of the ways in which the industries are attempting to adapt themselves to these changes. He emphasized the necessity on the part of the railroads of long range planning and greater attention to research on those larger problems which affect the very life and stability of the carriers. Among those who participated in the discussion were Professor Cunningham, Vice-President and General Manager J. W. Smith, and Chief Engineer W. J. Backes.

Lackawanna Program Provides Employment

The Delaware, Lackawanna & Western on April 1 will inaugurate its spring maintenance of way program, supplying employment to a considerable number of workmen along its lines in New Jersey, Pennsylvania and New York. Preparatory thereto the road has placed orders for a considerable quantity of track tools and has purchased 120,000 tons of crushed stone ballast from quarries served by its lines; also 3,000 tons of 130-lb. steel rail and 1,500 tons of track fittings to be rolled at the Buffalo plant of the Bethlehem Steel Company for laying during the months of April and May. This rail is in addition to the 4,500 tons ordered during January and February which is now being laid.

In addition, the Lackawanna is asking for bids for its 1932 requirements of solid steel wheels. It now has under construction by the American Locomotive Company at its Schenectady plant ten heavy high-speed freight locomotives and is also rebuilding six new switching locomotives in its own shops at Scranton and three combination mail and baggage cars at its Kingsland, N. J., shops, thereby augmenting the number of employees.

Railroad Valuation and Earnings

Frank W. Noxon, secretary of the Railway Business Association, has addressed a letter to Chairman Rayburn of the House committee on interstate and foreign commerce, in support of the argument for repeal of the railway valuation act, on the ground of the lack of relation between valuation and earnings.

"The leading argument urged by the Interstate Commerce Commission against repeal of the valuation section in the act to regulate commerce is that valuation is necessary in sanctioning security issues," Mr. Noxon said. "The Railway Business Association and others who favor repeal have asserted that valuation does have and can have no significance in passing on such applications, since the vital aspect is the prospect of earnings.

"A recent official statement introduced by the commission in a formal proceeding enables us to check the relation, or lack of relation, between valuation and earnings. The proceeding is Docket 12964, consolidation of railroads in Eastern territory. The statement is a table of Eastern systems in which 'primary value' is brought down to Dec. 31, 1930—the first official compilation of valuations under the law.

"Annexed to this letter are two tables showing valuation and 1931 net railway operating income—Table I including the 20 systems of highest valuation ranked in order of valuation, Table II including the 20 systems of largest income ranked in order of income. Attention is invited to some salient features.

"Only four systems—Pennsylvania, Norfolk & Western, Erie and Pittsburgh & Lake Erie—rank the same in valuation as in income. Of the others, only five come within one of ranking the same in both tables—New York Central; Baltimore & Ohio; Reading; Lackawanna; Buffalo, Rochester & Pittsburgh. The Chesapeake & Ohio stands as to valuation fourth, as to income second; the Lehigh Valley as to valuation ninth, as to income eleventh. The Central of New Jersey ranks as to valuation eleventh, as to income fourteenth. The New York, Chicago & St. Louis ranks as to valuation twelfth, as to income sixteenth; the Long Island, valuation thirteenth, income ninth; the Delaware & Hudson, valuation seventeenth, income thirteenth. The Virginian stands, valuation sixteenth, income tenth; the Western Maryland, valuation eighteenth, income twelfth. The Pere Marquette ranks as to valuation fourteenth, as to income twentieth. Two systems are not in the first 20 as to valuation but are in the first 20 as to income—the Bessemer & Lake Erie and the New York, Ontario & Western; while the Wabash, tenth, and the Alton, nineteenth, in valuation, reported deficits.

"Clinging to valuation as an index of what investors will be willing to pay for securities is merely the pertinacious trib-

(*Continued on page 545*)

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 169 Steam Railways, Including 17 Switching and Terminal Companies.

FOR THE MONTHS OF JANUARY, 1932 AND 1931

Item	United States		Eastern District		Southern District		Western District	
	1932	1931	1932	1931	1932	1931	1932	1931
Average number of miles operated	242,327.85	242,446.01	60,122.92	60,214.96	46,141.50	46,106.22	136,063.43	136,124.83
Revenues:								
Freight	$208,491,886	$277,074,662	$91,711,797	$119,012,328	$41,486,547	$54,649,579	$75,293,542	$103,412,755
Passenger	38,023,769	53,345,691	22,346,038	29,910,957	4,751,292	7,614,257	10,926,439	15,820,477
Mail	8,352,149	9,003,914	3,267,007	3,428,983	1,437,449	1,547,168	3,647,693	4,027,763
Express	3,774,287	5,959,559	1,621,850	2,260,795	787,134	1,019,197	1,365,303	2,679,567
All other transportation	9,713,745	11,969,854	5,691,717	6,924,386	657,543	889,477	3,364,485	4,155,991
Incidental	6,425,238	7,979,091	3,647,343	4,336,087	850,316	1,181,979	1,927,579	2,461,025
Joint facility—Cr.	846,362	989,229	277,154	318,771	133,260	156,173	435,948	514,285
Joint facility—Dr.	256,808	281,060	65,824	75,572	19,604	25,589	171,388	179,899
Railway operating revenues	275,370,628	366,040,940	128,497,082	166,116,735	50,083,937	67,032,241	96,789,609	132,891,964
Expenses:								
Maintenance of way and structures	30,342,856	43,737,391	13,166,524	19,331,059	6,726,215	9,142,007	10,450,117	15,264,325
Maintenance of equipment	58,056,942	77,265,299	26,432,325	36,003,234	10,652,739	13,895,539	20,971,878	27,366,526
Traffic	8,845,851	10,161,699	3,343,343	3,801,164	1,725,891	2,056,268	3,776,617	4,304,267
Transportation	115,049,568	143,438,373	54,193,050	67,621,035	18,760,211	23,911,856	42,096,307	51,905,482
Miscellaneous operations	2,937,595	3,966,012	1,476,661	1,930,180	390,374	537,032	1,070,560	1,498,800
General	14,624,586	16,087,975	6,461,961	7,008,480	2,483,129	2,818,967	5,679,496	6,260,528
Transportation for investment—Cr.	309,280	503,941	91,449	81,452	17,902	47,196	199,929	375,293
Railway operating expenses	229,548,118	294,152,808	104,982,415	135,613,700	40,720,657	52,314,473	83,845,046	106,224,635
Net revenue from railway operations	45,822,510	71,888,132	23,514,667	30,503,035	9,363,280	14,717,768	12,944,563	26,667,329
Railway tax accruals	24,406,699	26,930,986	9,793,090	10,379,308	4,631,875	5,435,844	9,981,734	11,115,834
Uncollectible ry. revenues	79,117	68,873	31,786	29,339	10,926	10,576	36,405	28,958
Railway operating income	21,336,694	44,888,273	13,689,791	20,094,388	4,720,479	9,271,348	2,926,424	15,522,537
Equipment rents—Dr. balance	7,040,625	8,019,473	3,643,098	4,192,274	500,691	464,266	2,896,836	3,362,933
Joint facility rent—Dr. balance	2,582,456	2,527,387	1,424,616	1,439,433	268,916	243,492	888,924	844,462
Net railway operating income	11,713,613	34,341,413	8,622,077	14,462,681	3,950,872	8,563,590	d 859,336	11,315,142
Ratio of expenses to revenues (per cent)	83.36	80.36	81.70	81.64	81.30	78.04	86.63	79.93

d Deficit or other reverse items.

Compiled by Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Strong-Arm Methods of Control Are OBSOLETE

FRANKLIN POWER REVERSE GEAR

Up goes the speed of freights from 15 to 30 even 45 miles per hour. Up, too, goes boiler horse power and tonnage.

Hand control of this tremendously increased power is obsolete. You can't expect a man to keep cut-off at the most efficient point as conditions vary if he must do it by sheer strength of arm.

Franklin Power Reverse Gears are the modern way of controlling modern power. They encourage the engineman to use all his skill by making it easy to get and keep the right cut-off, thereby obtaining maximum power and low fuel costs.

Thousands of locomotives testify to the satisfactory operation and low maintenance of Franklin Power Reverse Gears. Specify them for accurate control of modern power.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

Operating Statistics of Large Steam Railways—Selected Items for the Month of January, 1932,

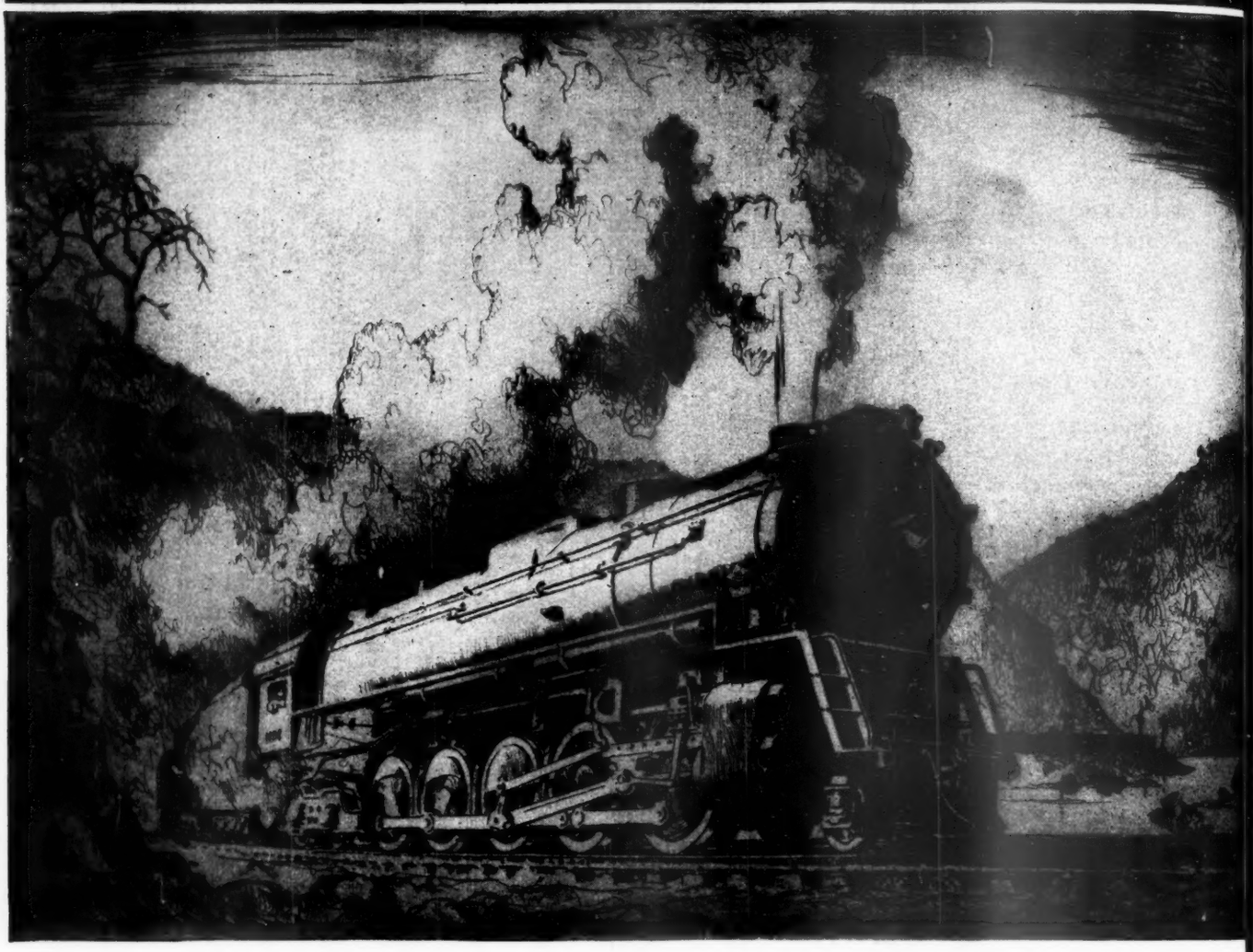
Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotives and tenders	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1932 402	134,253	138,811	9,041	3,493	65.5	181,298	59,633	72	63	46.6	17
	1931 407	159,292	165,429	12,561	4,060	65.2	216,064	78,215	91	39	30.4	31
Boston & Maine	1932 2,063	268,845	306,286	28,253	8,522	67.6	454,857	164,788	163	129	44.3	35
	1931 2,066	317,452	366,052	35,877	10,404	67.1	569,594	213,675	258	48	15.7	80
N. Y., New H. & Hart.	1932 2,055	351,535	420,115	23,026	11,115	63.5	610,431	220,725	229	110	32.5	17
	1931 2,094	395,482	458,801	24,157	12,545	62.4	718,254	273,606	273	81	22.9	35
Great Lakes Region:												
Delaware & Hudson	1932 848	213,288	274,037	28,207	6,404	60.3	406,201	183,335	251	22	8.0	150
	1931 876	272,651	357,257	35,923	8,247	60.2	533,792	247,833	243	29	10.5	117
Del., Lack. & Western	1932 998	321,111	348,722	39,158	10,195	65.7	581,520	226,064	212	57	21.3	52
	1931 998	411,351	453,378	51,525	12,816	65.4	755,044	313,852	218	63	22.3	26
Erie (inc. Chi. & Erie)	1932 2,316	596,775	624,113	57,289	25,361	62.4	1,512,340	561,716	364	129	26.2	147
	1931 2,316	722,770	758,647	64,272	30,820	61.7	1,906,270	765,667	387	94	19.6	120
Grand Trunk Western	1932 1,021	194,172	195,817	1,628	4,871	61.7	282,848	98,860	101	46	31.4	36
	1931 1,019	228,618	232,018	3,987	6,281	64.3	360,761	131,101	111	42	27.2	40
Lehigh Valley	1932 1,343	374,101	390,999	33,109	10,844	63.8	644,379	256,045	230	111	32.6	55
	1931 1,343	449,621	482,196	48,823	13,539	62.9	843,016	360,893	238	108	31.2	25
Michigan Central	1932 2,115	369,080	369,637	9,429	11,159	61.1	642,048	212,201	140	84	37.6	48
	1931 1,869	405,746	408,309	9,795	13,119	61.2	761,911	268,860	155	61	28.1	45
New York Central	1932 6,158	1,424,288	1,519,265	89,812	52,266	61.4	3,162,611	1,260,668	680	711	51.1	178
	1931 6,477	1,715,920	1,880,453	135,385	61,845	60.1	3,887,049	1,609,559	927	413	30.8	320
New York, Chi. & St. L.	1932 1,660	440,304	463,019	5,010	13,740	60.8	802,012	278,349	169	79	31.9	60
	1931 1,650	496,619	507,427	7,490	15,861	59.5	943,979	337,664	176	68	27.8	47
Pere Marquette	1932 2,202	291,620	296,053	2,986	6,911	59.8	431,478	164,040	145	33	18.4	42
	1931 2,201	314,281	324,525	2,361	7,444	60.5	467,577	185,895	167	19	10.4	63
Pitts. & Lake Erie	1932 235	52,848	54,005	812	2,151	57.2	173,412	93,804	56	35	38.6	32
	1931 232	87,129	88,636	739	3,153	56.3	257,095	139,756	54	20	27.4	24
Wabash	1932 2,497	510,910	527,817	10,302	15,263	63.2	869,709	288,592	248	134	35.1	55
	1931 2,497	667,692	697,731	13,038	19,041	60.7	1,142,353	396,451	289	116	28.7	53
Central Eastern Region:												
Baltimore & Ohio	1932 6,277	1,280,743	1,458,029	146,671	35,861	59.7	2,373,400	1,021,216	934	421	31.1	306
	1931 6,285	1,602,869	1,909,380	222,973	47,471	59.4	3,274,546	1,484,348	1,106	304	21.6	252
Big Four Lines	1932 2,790	589,509	608,926	16,341	17,250	60.2	1,130,888	510,310	245	197	44.6	34
	1931 2,723	647,505	673,216	20,973	19,443	60.4	1,292,060	595,919	290	137	32.0	48
Central of New Jersey	1932 692	155,600	167,446	23,681	4,434	55.5	308,305	137,976	124	54	30.4	52
	1931 692	203,392	220,004	31,080	5,976	55.8	424,369	199,500	149	40	21.1	42
Chicago & Eastern Ill.	1932 939	169,870	169,870	2,015	3,817	63.2	245,272	107,317	92	68	42.3	47
	1931 939	198,713	199,310	2,775	4,818	62.4	312,653	138,436	89	61	40.5	30
Elgin, Joliet & Eastern	1932 447	76,201	78,032	2,821	1,734	57.1	139,636	68,772	84	7	8.2	29
	1931 447	114,560	118,867	5,380	2,837	59.0	228,221	115,651	79	14	14.9	14
Long Island	1932 400	34,889	36,073	13,999	350	53.5	25,892	10,093	39	8	16.6	8
	1931 400	40,711	43,658	10,947	472	52.6	35,959	14,208	39	8	16.8	...
Pennsylvania System	1932 10,544	2,660,728	3,005,820	291,301	87,860	61.1	5,777,405	2,464,723	2,217	330	13.0	986
	1931 10,647	3,188,540	3,591,132	371,766	104,843	60.6	7,071,024	3,135,947	2,263	321	12.4	808
Reading	1932 1,451	425,488	457,087	44,671	11,122	57.4	810,581	378,309	320	94	22.8	98
	1931 1,446	567,047	612,540	53,274	14,764	57.4	1,111,966	542,405	315	71	18.4	44
Pocahontas Region:												
Chesapeake & Ohio	1932 3,136	745,391	782,929	29,262	28,780	55.8	2,406,616	1,285,855	569	95	14.3	264
	1931 3,116	1,067,443	1,137,217	46,444	37,883	55.0	3,183,261	1,707,255	598	91	13.1	201
Norfolk & Western	1932 2,258	543,312	570,924	24,819	18,902	60.3	1,519,541	793,518	446	37	7.6	202
	1931 2,226	688,276	752,246	38,273	23,866	59.3	1,969,642	1,030,559	448	46	9.3	162
Southern Region:												
Atlantic Coast Line	1932 5,144	618,420	619,175	8,733	12,877	58.3	709,209	224,615	383	89	18.9	97
	1931 5,162	721,561	729,154	10,399	16,089	57.8	919,394	311,036	393	76	16.2	82
Central of Georgia	1932 1,900	187,190	188,864	3,108	4,175	68.8	271,494	80,493	97	49	33.6	3
	1931 1,900	219,476	220,835	4,038	5,014	68.0	277,598	111,401	116	33	22.3	3
Ill. Cent. (inc. Y. & M. V.)	1932 6,670	1,261,573	1,271,855	20,476	29,746	59.8	1,997,758	786,190	750	164	17.9	60
	1931 6,683	1,518,979	1,536,259	26,940	37,462	61.4	2,496,858	1,037,593	702	192	21.5	48
Louisville & Nashville	1932 5,262	913,908	964,196	26,251	19,097	59.9	1,292,021	596,018	477	219	31.4	181
	1931 5,271	1,285,943	1,359,516	39,089	26,764	58.1	1,880,177	884,341	556	156	22.0	134
Seaboard Air Line	1932 4,449	496,926	509,447	6,673	11,578	59.8	687,166	218,555	260	33	11.3	36
	1931 4,466	546,747	557,599	6,010	13,111	61.1	780,365	273,180	274	26	8.7	16
Southern	1932 6,669	1,071,282	1,083,565	18,445	24,815	65.8	1,339,972	494,519	772	173	18.3	264
	1931 6,675	1,257,767	1,275,650	24,385	28,767	64.2	1,636,738	644,260	796	188	19.1	225
Northwestern Region:												
Chi. & North Western	1932 8,443	947,902	987,645	21,924	21,657	61.5	1,286,654	444,674	663	148	18.2	229
	1931 8,459	1,106,305	1,172,867	29,143	27,750	61.2	1,650,168	638,256	735	130	15.1	213
Chi. Gt. Western	1932 1,459	206,896	207,211	16,326	6,485	61.0	390,435	137,925	71	46	39.7	5
	1931 1,459	235,976	237,543	11,166	7,544	59.4	462,196	171,362	112	14	11.1	17
Chic., Milw., St. P. & Pac.	1932 11,265	1,134,755	1,201,079	64,236	27,179	59.8	1,710,271	664,388	767	149	16.3	384
	1931 11,301	1,346,071	1,423,011	70,892	35,695	61.1	2,218,534	893,695	789	141	15.2	322
Chi., St. P., Minn. & Om.	1932 1,714	216,618	233,560	10,900	4,027	63.1	240,504	103,801	146	25	14.8	73
	1931 1,714	252,981	275,562	12,102	5,278	63.3	311,481	127,093	154	24	13.5	53
Great Northern	1932 8,311	550,128	555,267	16,509	14,638	66.6	872,611	368,314	467	145	23.7	154
	1931 8,342	650,447	658,932	22,284	20,173	67.5	1,206,946	541,739	483	133	21.6	137
Minn., St. P. & S. St. M.	1932 4,325	326,864	332,183	3,192	6,375	65.0	350,229	136,711	138	55	28.7	22
	1931 4,356	353,768	360,245	3,212	8,551	66.9	473,194	200,320	176	62	26.0	45
Northern Pacific	1932 6,398	498,078	522,885	31,038	13,413	70.0	750,309	308,036	406	120	22.9	103
	1931 6,458	568,197	601,442	38,957	17,131	70.1	972,662	421,925	411	115	21.8	88
Oreg.-Wash. R. R. & Nav.	1932 2,219	150,071	155,979	8,794	3,363	68.5	198,535	82,609	108	20	15.9	47
	1931 2,218	162,916	170,556	11,464	4,315	70.2	256,192	114,347	112	20	15.0	44
Central Western Region:												
Alton	1932 989	193,546	194,920	1,230	3,903	55.7	259,523	87,090	102	25	19.4	25
	1931 1,000	227,065	235,182	1,828	5,098	56.8	330,446	119,560	119	22	15.8	35
Atch., Top. & S. Fe (incl. P. & S. F.)	1932 11,599	1,255,053	1,334,597	54,105	33,816	65.1	1,988,010	701,830	722	198	21.5	303
	1931 11,368	1,484,534	1,586,442	71,817	43,740	63.8	2,614,884	947,697	761	187	19.7	254
Chi., Burl. & Quincy	1932 9,250	1,035,168	1,073,094	34,894	27,809	59.2	1,689,977	730,522	531	122	18.7	58
	1931 9,274	1,223,367	1,259,714	42,151	37,042	61.4	2,258,908	1,028,862	602	139	18.8	70
Chi., Rock I. & Pacific (inc. C. R. I. & G.)	1932 8,342	1,055,818	1,084,693	7,699	23,810	59.5	1,450,223	514,185	537	135	20.0	154
	1931 8,219	1,190,002	1,226,554	6,846	29,222	60.9	1,779,851	681,061	541	145	21.2	153
Denver & R. G. Wn.	1932 2,557	189,713	211,535	29,074	5,043	62.1	316,595	132,597	207	34	14.1	47
	1931 2,569	229,804	251,842	26,703	5,810	62.2	368,300	158,430	224	23	9.3	63
Los Angeles & Salt Lake	1932 1,240	173,848	191,449	21,718	5,070	65.1	281,034	99,549	96	17	14.9	27
	1931 1,218	169,554	188,746	22,510	5,416	65.8	309,340	115,759	106	6	5.6	40
Oregon Short Line	1932 2,473	230,687	241,199	13,978	6,206	65.9	378,732	155,127	160	9	5.4	73
	1931 2,532	267,832	278,914	20,135	8,043	64.7	504,523	211,433	167	8	4.7	69
So. Pacific—Pacific Lines	1932 8,932	1,018,403	1,084,134	100,937	28,559	62.5	1,736,376	570,446	598	316	34.6	224
	1931 8,962	1,132,935	1,209,817	122,415	34,487	64.2	2,080,677	739,692	674	245	26.6	251
Union Pacific	1932 3,768	706,178	724,774	30,036	24,064	65.8	1,369,160	504,066	402	59	12.8	186
	1931 3,765	805,889	820,832	32,855	29,846	64.1	1,754,600	656,470	419	44	9.5	199
Southwestern Region:												
Gulf, Colo. & S. Fe	1932 1,943	182,236	184,009	2,949	4,597	65.8	265,738	106,104	102	22	18.0	36
	1931 1,965	194,026	201,272	3,682	5,379	64.4	329,079	136,241	100	20	16.8	32
Mo.-Kans.-Texas Lines	1932 3,282	329,973	331,797	4,802	8,661	62.3	504,342	181,316	166	58	25.7	86
	1931 3,176	334,402	339,754	5,267	9,791	59.5	592,587	223,286	148	88	37.3	65
Missouri Pacific	1932 7,409	1,078,674	1,102,119	26,229	27,827	60.4	1,737,962	639,094	490	89	15.4	203
	1931 7,423	1,248,705	1,279,712	34,474	34,500	60.2	2,208,575	853,199	561	89	13.6	223
St. Louis-San Francisco	1932 5,190	567,595	571,808	6,127	12,632	61.3	766,957	293,889	430	60	12.2	153
	1931 5,173	627,935	634,419	8,352	15,079	61.0	914,499	355,568	394	86	17.9	93
St. Louis Southwestern Lines	1932 1,902	189,696	194,908	2,578	4,797	65.6	262,116	84,384	114	29	20.3	46
	1931 1,902	217,605	226,140	2,950	6,012	62.7	349,222	118,778	99	31	23.5	24
Texas & New Orleans	1932 4,620	475,667	476,655	1,242	10,418	64.6	602,593	209,670	248	88	26.3	60
	1931 4,686	547,643	548,698	1,646	12,373	61.2	764,200	274,641	246	80	24.4	61
Texas & Pacific	1932 1,946	274,643	274,643	1,705	7,056	60.1	426,478	134,185	180	68	27.5	59
	1931 1,951	365,969	365,984	6,472	9,568	52.3	651,096	206,611	191	53	21.5	42

Compiled by Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Compared with January, 1931, for Roads with Annual Operating Revenues Above $25,000,000

Region, road and year	Average number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany	1932 4,067	2,752	6,819	21.7	21,565	1,350	444	17.1	282	25.2	4,788	162	35.3
	1931 3,890	3,220	7,110	8.0	20,004	1,356	491	19.3	355	28.3	6,198	173	44.2
Boston & Maine	1932 11,255	6,806	18,061	11.9	22,822	1,692	613	19.3	294	22.5	2,577	117	36.9
	1931 11,565	7,942	19,507	7.9	21,819	1,794	673	20.5	353	25.6	3,337	123	42.4
N. Y., New H. & Hart.	1932 16,216	11,288	27,504	5.5	24,749	1,736	628	19.9	259	20.5	3,465	113	42.1
	1931 15,447	12,477	27,924	4.0	24,307	1,816	692	21.8	316	23.2	4,214	119	44.0
Great Lakes Region:													
Delaware & Hudson	1932 11,865	2,556	14,421	3.6	25,906	1,904	860	28.6	410	23.8	6,972	128	35.7
	1931 10,220	3,871	14,091	4.0	24,332	1,958	909	30.1	567	31.4	9,130	137	46.7
Del., Lack. & Western	1932 19,483	3,506	22,989	7.2	24,973	1,811	704	22.2	317	21.8	7,306	150	46.6
	1931 19,508	4,466	23,974	5.6	24,561	1,836	763	24.5	422	26.4	10,143	160	58.0
Erie (inc. Chi. & Erie)	1932 36,634	10,422	47,056	3.6	38,199	2,534	941	22.1	385	27.9	7,824	109	44.6
	1931 37,896	12,723	50,619	3.2	37,583	2,637	1,059	24.8	488	31.8	10,666	115	55.2
Grand Trunk Western	1932 4,807	8,158	12,965	9.3	25,999	1,457	509	20.3	246	19.6	3,122	110	43.3
	1931 4,755	10,110	14,865	8.7	25,950	1,578	573	20.9	284	21.2	4,150	104	49.7
Lehigh Valley	1932 22,853	4,513	27,366	10.9	28,807	1,722	684	23.6	302	20.0	6,150	149	40.1
	1931 21,329	6,043	27,372	7.9	27,619	1,875	803	26.7	425	25.4	8,670	154	49.6
Michigan Central	1932 26,196	15,986	42,182	6.9	32,814	1,740	575	19.0	162	14.0	3,236	120	54.6
	1931 26,707	16,472	43,179	5.0	33,737	1,878	663	20.5	201	16.0	4,640	116	62.4
New York Central	1932 82,406	66,221	148,627	14.9	34,499	2,220	885	24.1	274	18.5	6,604	104	37.3
	1931 82,335	57,380	139,715	8.3	32,522	2,265	938	26.0	372	23.8	8,016	112	48.5
New York, Chi. & St. L.	1932 15,879	5,726	21,605	10.0	30,062	1,821	632	20.3	416	33.8	5,408	106	60.9
	1931 15,915	7,367	23,282	6.1	29,407	1,901	680	21.3	468	36.9	6,561	109	68.2
Pere Marquette	1932 13,185	3,846	17,031	3.5	24,717	1,480	563	23.7	311	21.9	2,403	98	54.1
	1931 13,373	4,345	17,718	3.1	23,827	1,488	591	25.0	338	22.4	2,724	101	56.6
Pitts. & Lake Erie	1932 19,518	5,958	25,476	18.5	38,485	3,281	1,775	43.6	119	4.8	12,882	106	19.4
	1931 21,382	4,053	25,435	7.0	36,812	2,951	1,604	44.3	177	7.1	19,431	113	39.1
Wabash	1932 19,683	7,115	26,798	4.5	32,855	1,702	565	18.9	347	29.1	3,729	121	45.4
	1931 21,129	8,544	29,673	5.7	31,682	1,711	594	20.8	431	34.1	5,122	124	56.6
Central Eastern Region:													
Baltimore & Ohio	1932 96,144	13,993	110,137	5.8	24,497	1,853	797	28.5	299	17.6	5,248	156	38.2
	1931 94,515	19,237	113,752	6.6	24,776	2,043	926	31.3	421	22.7	7,619	159	48.8
Big Four Lines	1932 23,434	17,525	40,959	10.4	31,738	1,918	866	29.6	402	22.6	5,899	122	45.6
	1931 25,204	21,068	46,272	4.7	31,185	1,995	920	30.6	415	22.4	7,060	120	52.4
Central of New Jersey	1932 18,141	6,052	24,193	15.4	26,583	1,981	887	31.1	184	10.7	6,430	153	34.6
	1931 18,326	7,370	25,696	8.6	25,864	2,086	981	33.4	250	13.4	9,297	152	42.8
Chicago & Eastern Ill.	1932 6,051	2,129	8,180	13.1	25,788	1,444	632	28.1	423	23.8	3,687	133	34.6
	1931 6,023	2,567	8,590	6.8	26,636	1,573	697	28.7	520	29.0	4,756	138	43.4
Elgin, Joliet & Eastern	1932 9,587	3,716	13,303	7.2	15,712	1,832	903	39.7	167	7.4	4,962	132	28.7
	1931 9,388	4,845	14,233	4.5	16,672	1,992	1,010	40.8	262	10.9	8,345	128	43.1
Long Island	1932 783	3,852	4,635	.6	5,811	742	289	28.8	70	4.6	813	383	34.4
	1931 745	4,533	5,278	1.3	6,556	883	349	30.1	87	5.5	1,145	327	38.0
Pennsylvania System	1932 249,008	64,640	292,648	6.5	31,002	2,171	926	28.1	272	15.8	7,540	134	41.7
	1931 240,362	52,356	292,718	5.2	29,636	2,218	984	29.9	346	19.1	9,501	135	49.5
Reading	1932 39,268	8,064	47,332	5.0	23,433	1,905	889	34.0	258	13.2	8,408	146	39.1
	1931 36,469	9,853	46,322	3.2	23,430	1,961	957	36.7	378	17.9	12,097	151	55.5
Pocahontas Region:													
Chesapeake & Ohio	1932 49,141	5,984	55,125	3.3	44,191	3,229	1,725	44.7	752	30.2	13,228	85	39.5
	1931 48,058	7,065	55,123	1.9	39,762	2,982	1,599	45.1	999	40.3	17,672	93	55.4
Norfolk & Western	1932 41,673	3,954	45,627	.9	41,402	2,797	1,461	42.0	561	22.2	11,337	117	39.8
	1931 40,231	5,294	45,525	.8	41,063	2,862	1,497	43.2	730	28.5	14,937	127	51.6
Southern Region:													
Atlantic Coast Line	1932 29,059	7,272	36,331	6.5	20,242	1,147	363	17.4	199	19.6	1,408	118	42.9
	1931 28,451	8,492	36,943	5.3	20,964	1,274	431	19.3	272	24.3	1,944	117	50.9
Central of Georgia	1932 8,273	1,582	9,855	21.1	20,094	1,183	430	19.3	263	19.9	1,367	132	42.4
	1931 7,906	2,181	10,087	12.0	19,689	1,265	508	22.2	356	23.6	1,892	140	48.7
Ill. Cent. (inc. Y. & M. V.)	1932 54,522	11,065	65,587	13.2	24,834	1,584	623	26.4	387	24.5	3,802	145	45.6
	1931 52,454	14,471	66,925	7.3	24,804	1,644	683	27.7	500	29.4	5,008	149	56.4
Louisville & Nashville	1932 53,524	5,909	59,433	15.8	21,196	1,414	652	31.2	323	17.3	3,653	154	45.9
	1931 51,280	9,053	60,333	11.2	20,964	1,462	688	33.0	473	24.6	5,412	152	63.4
Seaboard Air Line	1932 15,438	5,516	20,954	2.8	21,619	1,383	440	18.9	336	29.8	1,584	128	56.9
	1931 17,859	6,970	24,829	3.5	20,458	1,427	500	20.8	355	27.9	1,973	136	60.5
Southern	1932 57,691	8,665	66,356	13.9	20,311	1,251	462	19.9	240	18.3	2,392	158	37.6
	1931 55,568	11,051	66,619	13.0	19,784	1,301	512	22.4	312	21.7	3,113	167	42.6
Northwestern Region:													
Chi. & North Western	1932 45,659	16,835	62,494	6.8	19,951	1,357	469	20.5	230	18.2	1,699	150	40.2
	1931 54,412	19,980	74,392	7.7	20,465	1,492	577	23.0	277	19.7	2,434	144	44.8
Chi. Gt. Western	1932 5,234	3,549	8,783	10.0	31,103	1,887	667	21.3	507	39.0	3,049	145	61.6
	1931 4,882	3,617	8,499	8.1	30,743	1,959	726	22.7	650	48.2	3,789	132	63.4
Chi., Milw., St. P. & Pac.	1932 65,176	11,250	76,426	2.6	22,775	1,507	585	24.4	280	19.2	1,902	138	44.6
	1931 63,395	13,585	76,980	2.0	23,503	1,648	664	25.0	374	24.5	2,551	130	51.8
Chi., St. P., Minn. & Om.	1932 2,393	7,992	10,385	9.7	16,449	1,110	479	25.8	322	19.8	1,954	141	46.0
	1931 2,964	8,654	11,618	6.6	17,146	1,231	502	24.1	353	23.1	2,392	132	52.0
Great Northern	1932 45,232	7,329	52,561	6.3	23,141	1,586	670	25.2	226	13.5	1,430	152	30.1
	1931 43,889	8,081	51,970	4.5	25,137	1,856	833	26.9	336	18.5	2,095	135	35.7
Minn., St. P. & S. St. M.	1932 20,800	2,511	23,311	3.4	16,586	1,071	418	21.4	190	13.6	1,020	128	56.1
	1931 20,651	2,831	23,482	4.1	18,596	1,338	566	23.4	275	17.5	1,484	112	49.3
Northern Pacific	1932 43,136	4,197	47,333	8.7	22,456	1,506	618	23.0	210	13.1	1,553	164	34.0
	1931 43,218	5,054	48,272	8.5	24,261	1,712	743	24.6	282	16.3	2,108	157	39.3
Ore.-Wash. R.R. & Nav.	1932 9,521	1,815	11,336	5.1	21,136	1,323	550	24.6	235	14.0	1,201	165	41.3
	1931 8,094	2,206	10,300	3.5	22,956	1,573	702	26.5	358	19.3	1,663	162	44.6
Central Western Region:													
Alton	1932 4,269	3,255	7,524	4.2	25,787	1,341	450	22.3	373	30.1	2,841	128	49.8
	1931 10,906	3,328	14,234	6.9	25,495	1,455	527	23.5	271	20.3	3,858	130	54.1
Atch., Top. & S. Fe (incl. P. & S. F.)	1932 69,268	9,812	79,080	9.1	28,320	1,584	559	20.8	286	21.2	1,952	119	48.7
	1931 69,528	12,875	82,403	7.5	30,385	1,761	638	21.7	371	26.9	2,689	113	56.4
Chi., Burl. & Quincy	1932 47,112	11,326	58,438	6.3	25,170	1,633	706	26.3	403	25.9	2,547	134	54.8
	1931 46,895	13,372	60,267	5.5	27,615	1,846	841	27.8	551	32.3	3,579	126	56.6
Chi., Rock I. & Pacific (incl. C. R. I. & G.)	1932 42,115	11,134	53,249	10.6	21,940	1,374	487	21.6	311	24.3	1,988	152	52.4
	1931 40,997	12,214	53,211	7.4	22,913	1,496	572	23.3	413	29.1	2,673	147	58.0
Denver & R. G. Wn.	1932 13,593	3,398	16,991	3.9	22,130	1,669	699	26.3	252	15.4	1,673	189	32.3
	1931 12,702	3,261	15,963	2.4	21,029	1,603	689	27.3	320	18.9	1,989	187	36.4
Los Angeles & Salt Lake	1932 5,059	1,112	6,171	3.0	26,816	1,617	573	19.6	520	40.7	2,590	156	61.2
	1931 5,188	1,216	6,404	2.3	27,161	1,824	683	21.4	583	41.5	3,066	132	60.8
Oregon Short Line	1932 9,473	5,069	14,542	6.9	25,262	1,642	672	25.0	344	20.9	2,024	129	48.7
	1931 7,356	4,962	12,318	5.7	28,077	1,884	789	26.3	554	32.5	2,694	114	55.2
So. Pacific—Pacific Lines	1932 45,202	22,786	67,988	11.4	26,362	1,705	560	20.0	271	21.7	2,060	131	41.8
	1931 42,873	24,454	67,327	5.3	27,117	1,837	653	21.4	354	25.7	2,663	124	46.8
Union Pacific	1932 24,894	7,334	32,228	8.7	38,323	1,939	714	20.9	505	36.6	4,315	129	52.8
	1931 26,327	7,293	33,620	10.7	40,623	2,177	815	22.0	630	44.6	5,625	115	59.5
Southwestern Region:													
Gulf, Colo. & S. Fe	1932 14,809	1,749	16,558	2.7	23,417	1,458	582	23.1	207	13.6	1,761	114	48.4
	1931 12,634	2,204	14,838	2.6	27,935	1,696	702	25.3	296	18.2	2,237	103	54.8
Mo.-Kans.-Texas Lines	1932 12,263	2,626	14,889	5.0	25,427	1,528	549	20.9	393	30.1	1,782	103	48.6
	1931 14,876	3,770	18,646	5.5	27,862	1,772	668	22.8	386	28.5	2,268	101	47.1
Missouri Pacific	1932 31,612	11,007	42,619	12.2	26,810	1,611	592	23.0	484	34.9	2,783	130	62.8
	1931 33,984	13,703	47,687	10.1	28,073	1,769	683	24.7	577	38.8	3,708	127	65.2
St. Louis-San Francisco	1932 28,722	5,030	33,752	3.2	21,133	1,351	518	23.3	281	19.7	1,827	143	38.0
	1931 27,926	6,042	33,968	2.9	21,788	1,456	566	23.6	338	23.5	2,217	145	43.2
St. Louis Southwestern Lines	1932 6,044	2,532	8,576	9.7	23,441	1,382	445	17.6	317	27.5	1,431	120	44.6
	1931 7,237	2,913	10,150	7.6	24,572	1,605	546	19.8	377	30.5	2,015	112	56.9
Texas & New Orleans	1932 12,855	9,922	22,777	7.7	20,228	1,267	441	20.1	297	22.8	1,464	104	45.8
	1931 12,787	12,685	25,472	4.9	21,390	1,395	501	22.2	348	25.6	1,890	101	54.5
Texas & Pacific	1932 6,288	3,663	9,951	11.7	24,983	1,553	489	19.0	435	38.0	2,225	94	35.9
	1931 6,944	4,705	11,649	6.9	27,826	1,779	565	21.6	572	50.7	3,417	91	49.3

MODERN MO



LIMA
LOCOMOTIVE WORKS
INCORPORATED

LIMA LOCOMOTIVE WORKS

TIVE POWER

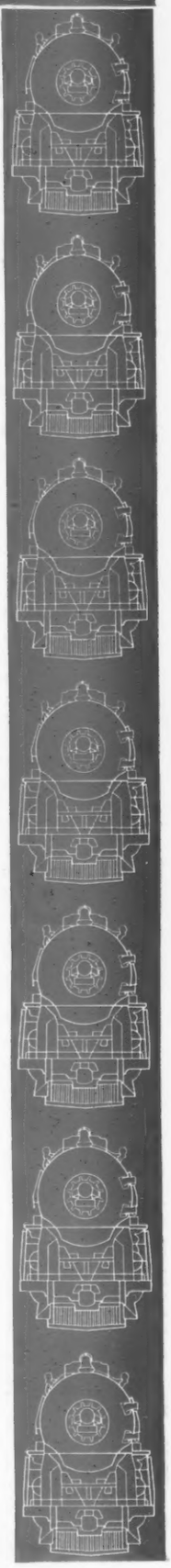
HELPED THE C. & O.

- lower their operating ratio
- improve fuel performance
- increase net tons per train

A study of operating statistics for a recent period compared with the same period in the previous year, shows that the Chesapeake & Ohio made the following remarkable record:

1. It showed a gain of 8% in net tons per train;
2. It recorded an increase of 10.6% in gross ton miles per train hour;
3. It showed a 9% decrease in unit coal consumption;
4. It recorded an operating ratio of 57.6%

All credit to the splendid organization that performed so effectively and to the management that gave it efficient working tools! « Foremost among these tools are 40 Lima-built Super-Power Locomotives, the most powerful two-cylinder locomotives ever built. « With such modern motive power, train speeds were substantially increased and heavier trains hauled at lower cost. « It is significant that the roads making the best showing even in these days of low traffic are those pursuing a progressive motive power policy.



Incorporated • LIMA • OHIO

NEWS

(*Continued from page 542*)

ute rendered to a superstition which never had any relation to real life and only awaits repeal by Congress to become defunct even as a theory."

Reduced Silk Rates to the South

Lower freight rates on silk placed in effect on transcontinental shipments on December 28, when the rate was reduced from $9 per 100 lb. to $6, will be extended to include southern points, effective April 11. Under the new ruling the lower rate will apply on shipments to Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Louisiana and parts of Virginia. Raw silk landed at all west coast points, except San Francisco and Los Angeles, when routed to these southern points, may be held at Chicago for "testing and throwing."

P. R. R. Reduces Pensions and Officers' Salaries

The Pennsylvania will, effective April 1, reduce all pension payments except in cases where the decrease would result in monthly payments of less than $50. The reduction is called in the company's announcement "an unavoidable measure of economy" and it is pointed out that "the reduction will bring pensions in line with the decrease of 10 per cent already effected in all wages and salaries."

The statement says further: "A second reduction of 10 per cent in all officers' salaries will become effective April 1. As the cost of living in the last two and one-half years has fallen much more than the decrease in pensions and wages, the actual purchasing power of both retired and active employees will continue at a level higher than that of 1929."

The total number of P. R. R. stockholders reached 248,010 on March 1, the average holding being 53.07 shares. It is believed that accumulation of the stock for investment purposes is "going ahead steadily."

Total dividends distributed by the company since it was chartered in 1846 have passed the billion mark, the figure of $1,031,246,238 having been reached with the last quarterly payment. Distributions have been made in each year beginning with 1847, although the company has announced that their continuance, unless earnings improve, is now in jeopardy.

N. Y. Truck Tax Boost Falls Short of Goal

(*Continued from page 538*)

1, 1933. Furthermore, possibly with the hope of repealing the whole measure early in the 1933 session and before it becomes effective for vehicles now operating, there has been inserted a stipulation that the commissioner of motor vehicles shall accept no re-registrations for 1933 until on or after February 15, 1933.

With the 65 per cent increase applied to existing rates the following table reveals what changes in fees the amendments bring:

Buses

Capacity	Present Tax	New Tax
Five passengers	$15.00	$24.75
Seven passengers	24.50	40.42
Eight passengers	30.50	50.33
Eleven passengers	43.00	70.05
Seventeen passengers	52.00	85.80
Twenty-one passengers	55.00	90.75
Twenty-three passengers	61.50	101.48
Twenty-seven passengers	67.50	111.38

Capacity thirty passengers or more, plus $2 for each extra passenger under old rates and $3.20 under new rate over the rate for the twenty-seven-passenger bus.

Electric Buses

Fifty per cent increase over present rates for buses.

Franchise Buses

Buses operating over fixed routes in cities under franchises requiring payment on percentage of gross receipts as a franchise tax are exempted from the new taxes, but are subject to $16.50 tax each instead of $10, as at present.

Hearses

Unladen	Old Rate	New Rate
Less than 1,800 pounds	$12.00	$19.80
Over 1,800 pounds, each 100 pounds additional	.75	.24
(Electric trucks 50 per cent extra.)		

Light Delivery Trucks

Less than 1,800 pounds	$12.00	$19.80
(Electric trucks 50 per cent extra.)		

Other Trucks

1,800 pounds or more, each 100 pounds	.80	1.32

In addition to the foregoing, the gasoline tax was increased from two to three cents a gallon and over-all length limitation of vehicles was reduced from 85 to 65 feet.

The tax increase measure as originally framed was based on the findings of the New York State Commission for the Revision of the Tax Laws, a body created in 1930 to make a scientific survey of the distribution of the taxation burden in the state. The proposed revisions of the motor vehicle laws were among the unanimous recommendations of this commission, the membership of which included outstanding economists and business men.

The commission first of all proposed gross weight (weight of the vehicle plus capacity) as the basis for computing fees since this was in accord with the opinion "of the best authorities." It also proposed double taxation of solid tired vehicles, a two-cent increase in the gasoline tax, a special tax on common carrier motor vehicles and a special license fee on other motor vehicles for hire.

To contrast the fees enacted as embodied in the accompanying table with those recommended by the commission and included in the original bill some examples of the proposals are given here. The commission recommended that the annual tax on a truck of 28,000 lb. gross weight be increased from $120 to $498. Actually, the 28,000 lb. truck will pay $198 on the net weight basis. On the basis proposed by the commission a solid tired truck of 28,000 lb. gross weight would pay $996; on the basis enacted it will pay the $198 on the net weight basis, the same as a pneumatic-tired vehicle. Whereas the commission and the original bill proposed drastic increases in the rates per 100 lb. with each successive increase in the gross weight of vehicles, the law passed kept the rate constant when it increased it from 80 cents to $1.32 per 100 lb. for trucks weighing over 1,800 lb. In the original bill, for example, the rate went as high as $36.70 for each 100 lb. of gross weight in excess of 64,000 lb.

It is generally felt that the proponents would have put over the more effective measure had not the opposition of the intra-city interests developed. These interests, it is believed, are coming to feel that their plight is similar to that of the railroads; that they no more than the steam carriers or private motorists should be taxed to build highways for long-distance operators. Had the framers of the original bill exercised sufficient foresight and exempted intra-city trucks there is little doubt but that the opposition which finally frustrated their efforts would have failed to reach such formidable proportions.

Equipment and Supplies

IRON & STEEL

THE GREAT NORTHERN has ordered 417 tons of structural steel for additions to its shops at Klamath Falls, Ore., 255 tons being placed with the Poole-McGonigle Company and 162 tons with the Truscon Steel Company.

THE READING COMPANY has awarded a contract to the McClintic-Marshall Corporation for about 3,000 tons of structural steel, for the catenary structures in connection with the electrification of the railroad's Norristown and Chestnut Hill branches.

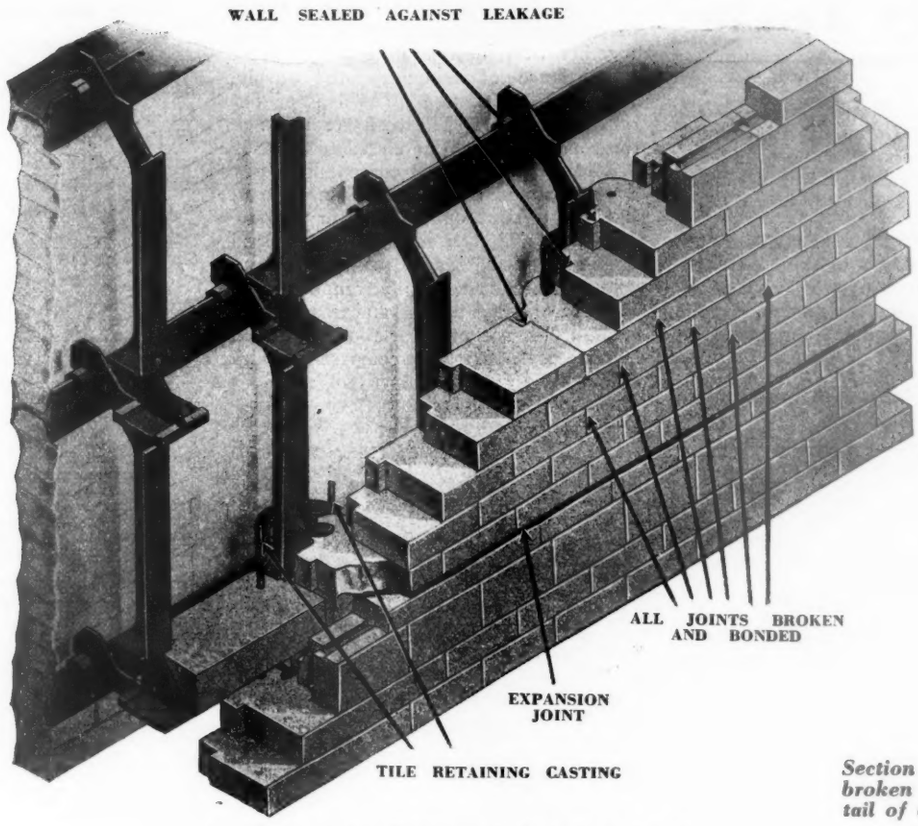
THE DELAWARE, LACKAWANNA & WESTERN, reported in the *Railway Age* of January 23 as having placed an order for 4,000 tons of 130-lb. rail with the Bethlehem Steel Company, also placed an order for 500 tons in February and has just given an additional order for 3,000 tons to the same builder. An order was also placed for the necessary track fittings, 1,500 tons, with the Bethlehem company.

THE NEW YORK CENTRAL LINES will start work next week on the laying of new rail. The initial program for the current year contemplates the laying of 50,000 tons, of which about 20,000 tons are now on hand and orders for the balance of 30,000 tons, will be placed shortly. The present program represents the minimum requirements for early maintenance work, and it is the intention to place further orders later if business conditions warrant.

SIGNALING

THE READING COMPANY has ordered from the Union Switch & Signal Company material for automatic block signals to be installed in the electrified territory on its Chestnut Hill branch (Philadelphia); 13 color-light signals and the necessary relays, transformers, switch indicators, etc.

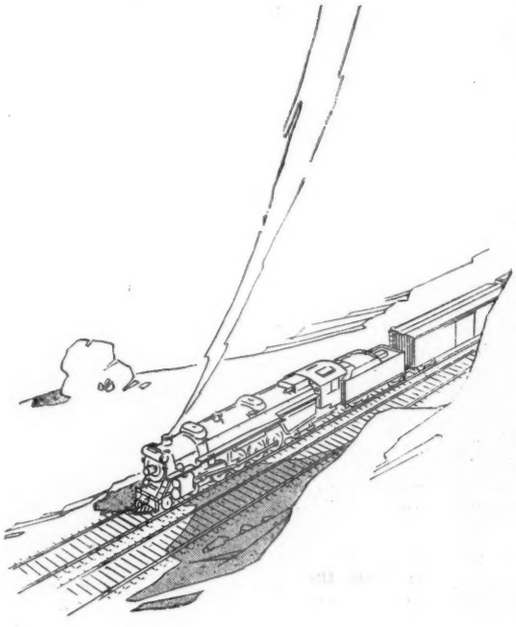
Continued on Next Left Hand Page



Section of wall partly broken away shows detail of design

American sectionally supported air-cooled wall

American Arch Company Combustion Experience Drawn Upon By All Industry



WITH a majority of the country's locomotives equipped with American Arch Company's Security Sectional Arch, new fields were sought in which to apply this company's engineering skill.

Today the greatest steel plants come to American Arch Company for suspended furnace roofs.

Boiler plants in the most efficient Central Stations use American Arch Company sectionally supported side walls and Arches.

Oil still Arches and air-cooled side walls by American Arch Company are features of the most up-to-date oil refineries.

The wealth of combustion experience that has been accumulated during 21 years by American Arch Company is being drawn upon liberally by a variety of industries. It is still an integral part of the Arch Brick service rendered to American railroads.

AMERICAN ARCH COMPANY

Incorporated

NEW YORK CHICAGO

Supply Trade

George Paull Torrence, vice-president of the **Link-Belt Company,** Chicago, in charge of its Indianapolis operations, has been elected president, with headquarters at Chicago.

R. W. Cornelisen, formerly assistant general sales manager of the Lakewood Engineering Company, has been appointed field sales manager of the **Northwest Engineering Company,** Chicago.

The Railroad Materials Corporation, New York, has been appointed eastern representatives of the **Premax Products Corporation,** Niagara Falls, N. Y. This company manufactures aluminum letters and figures for railroad use.

General American Tank Car Corporation

The annual report of the General American Tank Car Corporation and subsidiaries for 1931 shows a net profit of $4,011,268, as compared with $6,518,181 in 1930. The consolidated summary of income and the consolidated surplus account follow:

	1931	1930
Gross income from sales, rentals, etc.	$29,185,011	$37,860,545
Add dividends, interest and other income from investments	963,201	.....
	$30,148,212	$37,860,545
Less: Cost of sales, expenses and all taxes	19,664,796	26,547,741
Interest on equipment trust notes	2,014,873	1,374,441
Depreciation	4,138,277	3,296,277
Provision for dividends of subsidiaries	318,999	123,905
	$26,136,945	$31,342,364
Net Profit	$4,011,267	$6,518,181
Balance — December 31, 1930	$48,749,056	$45,400,015
Net profit for year ended December 31, 1931	$4,011,268	.....
Sundry adjustment	118,135	.....
	$4,129,403	$6,518,181
	$52,878,459	$51,918,196
Deductions		
Dividends paid and provided for	$3,120,159	$3,169,140
Adjustment of cost of treasury stock to $5 per share stated value, after credit of proceeds from stock sold	3,071,742	.....
Write-down of securities to indicated market value December 31, 1931	2,791,641	.....
	$8,983,542	$3,169,140
	$43,894,917	$48,749,056

Lester N. Selig, president, in his remarks to stockholders states:

During the past year your company has made further important contributions to the field of industrial transportation. The latest development of our engineering and research departments has been the Dry-Flo tank car, now fully perfected and tested in service, which will haul and automatically unload dry commodities that flow, such as cement, sand, flour and many similar products. Your management believes that there is a large field of use for this type of equipment and is confident that this important new transportation development will produce splendid results

Fairbanks, Morse & Co.

The annual report of Fairbanks, Morse & Co. shows a loss of $5,352,931, which, after applying the net income of the Municipal Acceptance Corporation, was reduced to $5,168,054. Dividends paid and the appropriation for the redemption of preferred stock totaled $816,944, which, together with the operating loss, reduced the balance of unappropriated surplus from $12,812,472, to $6,827,473 as of December 31, 1931. The cash resources of the company which amounted to $14,836,212, exceeded the total current liabilities, which amounted to $1,526,244, a ratio of 10 to 1. All requirements for the redemption and retirement of preferred stock and of the 5 per cent sinking fund gold debentures were fully complied with. The consolidated income and unappropriated surplus accounts for the year ended December 31, 1931, with comparisons with 1930, follow:

	1931	1930
Net Sales	$15,617,817	$24,126,048
Gross Operating Loss	1,832,075	(Income) 2,004,908
Provision for depreciation	835,441	826,348
Interest on debentures	345,333	361,333
Contrib. to the pension fund	.....	132,978
Federal income tax	.....	42,521
Net profit of Municipal Acceptance Corp.	.....	179,884
	$3,012,849	$821,612
Extraordinary charges	3,015,259	.....
Less—Special non-recurring income	675,177	.....
	$2,340,082	$821,612
	$5,352,931	$821,612
Deduct — Net income of Municipal Acceptance Corporation	184,877	
Surplus and undivided profits at December, 31, 1930, per last report	.....	$10,114,089
Subsidiary companies	.....	3,908,874
Add—Adjustments pertaining to prior yrs.	.....	2,475
	$5,168,054	$14,847,050
Deduct— Premium paid on preferred stock retired	.....	7,142
	$5,168.054	$14,839,908
Dividends paid on 7% preferred stock	431,148	478,028
On common stock	295,097	977,508
Appropriation for redemption of preferred stock	90,700	571,900
	$5,984,999	$12,812,472
Balance of unappropriated surplus, December 31, 1930	12,812,472	
Balance of unappropriated surplus, December 31, 1931	$6.827,473	$12,812,472

Ryan Car Company

The annual report of the Ryan Car Company for 1931 shows a loss of $301,985, as compared with a loss of $31,638 in 1930. Sales amounted to $270,512 in 1931, as compared with $2,635,045 in 1930. W. M. Ryan, president, in his report to stockholders, stated that the directors decided to reduce the stated value of common stock from $2,588,525 to $635,410, the action following the sale of the road machinery division to the Allis-Chalmers Manufacturing Company. The consolidated income account for 1931, as compared with 1930, follows:

	1931	1930
Gross sales	$270,512	$2,635,045
Cost of sales	416,843	2,502,506
Depreciation	113,316	110,734
Interest, etc.	42,338	53,443
Net loss	301,985	31,638

North American Car Corporation

The annual report of the North American Car Corporation shows a net profit of $554,719 in 1931, as compared with $1,149,965 for 1930. Dividends paid in 1931 amounted to $140,622, as compared with $566,198 in 1930. The consolidated income account for 1931, as compared with 1930, follows:

	1931	1930
Gross income	$3,826,145	$4,356,293
Sundry income	147,749	97,288
	$3,973,894	$4,453,581
Expenses and repairs	1,870,330	1,898,367
Depreciation	888,010	766,317
Interest paid	549,189	584,677
Sundry expenses	111,646	54,255
Net profit for the year	$554,719	$1,149,965
Surplus beginning of year	$271,647	$622,305
	$826,366	$1,812,270
Dividends paid	140,622	566,198
Surplus credits	.....	936,539
Marine equipment written off	.....	1,714,607
Reserve for contingencies	.....	100,000
Goodwill of subsidiary written off	.....	96,359
Experimental expenses, etc.	217,973	.....
Amortization of appreciation	40,325	.....
Surplus end of year	$427,446	$271,647

N. L. Howard, president, in his letter to stockholders, says:

Operations during 1931 were generally satisfactory in view of business conditions. Poultry car shipments, which comprise an important part of the company's business, were approximately nine per cent less than in 1931, while refrigerator cars were fully occupied during the year. Tank car business was satisfactory until early in August, at which time production was materially curtailed throughout the mid-continent field by various state authorities, this restriction continuing generally up to the close of 1931. This situation necessitated the re-location of a large number of the company's tank cars, which resulted in material profits from this department.

OBITUARY

Francois de Saint Phalle, vice-president in charge of export sales of the Baldwin Locomotive Works, Philadelphia, Pa., from March, 1919, to August, 1928, died on March 16 at his home in Paris, France, at the age of 47. At the time of his death Mr. de Saint Phalle was a partner in the New York Stock Exchange firm of de Saint Phalle & Co., in charge of its Paris office.

John T. Clancy, assistant manager of oil and gas engine sales of the Worthington Pump & Machinery Corporation, Harrison, N. J., died suddenly of a heart attack on March 9, while lecturing at the Engineers' Club, New York City, before a meeting of the American Society of Mechanical Engineers. Mr. Clancy was born in 1890 at New Brunswick, N. J. After attending the schools of his native town, he studied at Betts Academy, Stamford, Conn., and later at Bowdoin College, where he was graduated in 1913, and at Catholic University. He served as an instructor in mathematics and chemistry at the Army & Navy School, Washington, D. C., and in 1917 entered the army and was in overseas service as captain of field artillery with the A.E.F. Mr. Clancy went to the Worthington Pump & Machinery Corporation in 1919 and in 1923 he was appointed assistant manager of oil and gas engine sales with headquarters at Buffalo, N. Y., and since 1931, with headquarters at New York, which position he held at the time of his death.

Construction

CHICAGO, ROCK ISLAND & PACIFIC—MISSOURI - KANSAS - TEXAS — ST. LOUIS SOUTHWESTERN.—It is expected that the city of Dallas, Tex., will ask for bids in the near future for the construction of a subway to carry the combined Lamar and McKinney streets under 12 tracks of these companies. The total cost of the project is estimated at $255,000.

ERIE.—A total preliminary estimate of cost, exclusive of land and damages, in connection with the elimination of a number of Erie grade crossings in the city of Elmira, N. Y., has been approved by the New York Public Service Commission, with the stipulation that that part of the estimate applying to stages of the work other than the first shall be subject to further determination. The commission has also approved the bid submitted by the H. E. Culbertson Company, Cleveland, Ohio, the lowest of 31 received, covering the first stage of the elimination work, and has directed the railroad to award the contract and begin construction as soon as practicable. Crossings affected by the entire project are those at Miller, Home, LaFrance, Partridge, Henry, Hudson, Water, Gray, Church, First, Second, Fifth and Market streets, Pennsylvania and Railroad avenues, and Chemung place. Plans and cost estimates for the elimination of the Pingleton, Middle and Winship crossings of the Erie tracks in New Albion, N. Y., have also been approved by the commission.

GREAT NORTHERN.—The enginehouse for the construction of which this company recently awarded a contract to A. Guthrie & Company, Portland, Ore., will be built at South Klamath, Ore., instead of at Bend, as previously reported by the company. A contract for the installation of a direct steaming system in the new structure has been awarded to the Railway Engineering Equipment Company, Chicago, while the W. M. Lorenz Heating & Ventilating Co., Klamath Falls, Ore., has the contract for installing the power plant piping.

LONG ISLAND.—Tentative proposals, setting forth possible methods of eliminating 20 grade crossings on this company's Atlantic Avenue branch between East New York and Jamaica, N. Y., have been submitted to the New York City Transit Commission by a joint board of engineers. One of the suggested plans calls for track elevation and another for depression of tracks in an open cut, the cost, in either of these cases, being estimated at $23,649,000. It has been suggested that the city should pay more than two-thirds of this amount, and the state about one-half of the balance, leaving approximately one-sixth of the total as the railroad's share. Elimination of existing crossings on the Atlantic Avenue line, part of which is already elevated, has been under consideration for some five years, and since the pending proposals for their removal will require considerable additional study by the Transit Commission and the railroad, it is unlikely that there will be any further action of a definite nature in the near future.

NEW YORK CENTRAL.—The Public Service Commission of New York has added to its list of grade crossings to be considered for elimination during 1932 the Goff, Seneca, Horton, South and Willow street crossings of this company's tracks, all in Weedsport, N. Y. These crossings were put on the 1932 program in order that they might be taken up in connection with the proposed elimination of other crossings in the same village, where a relocation of the railroad, which would affect these five crossings, is under consideration. The commission has closed proceedings for elimination of the North Ilion crossing of the New York Central, just east of North Ilion station, Herkimer, N. Y.

SOUTHERN PACIFIC.—A contract has been been awarded to the Thompson Construction Company by the city of Fresno, Cal., for the construction of a subway to carry Belmont avenue, Fresno, under the tracks of this company. The estimated cost of the project is $240,000.

Financial

AKRON, CANTON & YOUNGSTOWN.—*Annual Report.*—The 1931 Annual Report of this company and the Northern Ohio Railway shows net deficit after interest and other charges of $26,060, as compared with net income of $300,502 in 1930. Selected items from the Income Statement follow:

	1931	1930	Increase or Decrease
RAILWAY OPERATING REVENUES	1,915,686	2,720,402	—804,716
Maintenance of way	246,174	443,457	—197,283
Maintenance of equipment	195,510	267,564	— 72,054
Transportation	594,423	780,396	—185,973
TOTAL OPERATING EXPENSES	1,346,096	1,874,518	—528,422
Operating ratio	70.23	68.50	+ 1.73
NET REVENUE FROM OPERATIONS	570,282	857,036	—286,754
Railway tax accruals	148,889	45,507	+103,382
Hire of freight cars	176,300	282,866	—106,566
Joint facility rents	5,009	13,319	— 8,310
NET RAILWAY OPERATING INCOME	252,040	547,354	—295,314
GROSS INCOME	332,450	665,113	—332,664
Interest on funded debt	330,274	345,150	— 14,877
TOTAL DEDUCTIONS FROM GROSS INCOME	358,510	364,611	— 6,100
NET INCOME	*26,060	300,503	—326,563

* Deficit.

ARLINGTON & FAIRFAX.—*R. F. C. Loan.*—This company has applied to the Interstate Commerce Commission and the Reconstruction Finance Corporation for a loan of $25,000 to meet interest and current expenses and to provide financing for a subsidiary, the Arlington & Fairfax Motor Transportation Company, organized to operate motor busses, of which Dr. Julius H. Parmelee, director of the Bureau of Railway Economics, is president.

BALTIMORE & OHIO.—*R. F. C. Loan.*—This company on March 21 applied to the Reconstruction Finance Corporation and the Interstate Commerce Commission for a loan of $55,000,000 to aid it in meeting requirements estimated at $58,538,405 this year for unpaid accounts, acquisition of property, equipment trust obligations, taxes, notes, loans and uncompleted additions and betterments. of the total $7,000,000 was desired by March 30 and $8,000,000 by May 24. As collateral it offered $55,813,000 of refunding and general mortgage bonds, of which $29,536,500 are now held in the treasury and the company proposes to apply for authority to issue $26,276,500 additional to reimburse the treasury for expenditures for additions and betterments. The requirements by dates were listed as follows: before March 30, $6,390,905, including $2,000,000 for past due vouchers for accounts payable on demand, and $796,000 for Chicago and Cook county taxes; before May 24, $8,215,500, including $8,000,000 for short term loans due May 25; by June 30, $575,000; by July 29, $490,000; by August 8, $35,000,000, to meet that amount of 4 per cent gold notes maturing August 10; by September 30, $50,000; by October 31, $1,332,000 and by November 30, $510,000, and at various times through the year, $4,000,000 for additions and betterments. The amounts needed include $4,870,000 payable on equipment trust obligations at various dates throughout the year, and also $1,000,000 for loans from three banks due April 26. The application states that the company has large maturities in 1932 and 1933 but the low prices at which its securities are selling are such as to preclude the possibility of meeting its requirements through the usual channels on reasonable terms. The net income for the year is estimated at $7,063,628 and it is stated that the company does not expect to apply to the Railroad Credit Corporation unless unforeseen contingencies occur. The amount to be derived from the temporary rate increase during the year is estimated at $5,209,347 to $5,287,678.

Later the company filed its application for authority to nominally issue $55,813,000 of refunding and general mortgage bonds, dated December 15, 1915, and maturing April 15, 2000, and to pledge them as collateral for the loan.

BOSTON & MAINE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $7,500,000 of first mortgage 5 per cent gold bonds, to be pledged and repledged from time to time as collateral for short-term notes.

CANADIAN PACIFIC. — *Bonds.* — Public offering is being made by a syndicate of banks and bond houses headed by the Bank of Montreal, of a new issue of $12,500,000 convertible 10-year, 6 per cent collateral trust bonds of the Canadian Pacific. These bonds, which are being

Continued on Second Left Hand Page

again by---!

WE know of several roads today that are handling all their freight traffic with big wheel modern freight locomotives. Freight is being handled at almost passenger train speeds, and there are cases where these big modern engines are doing 12,000 miles and more per month. These roads today are being operated just about as economically as it is possible to do so.

But, some day traffic will pick up. And orders will come down the line to put in service 25 or 50 of the older engines now in storage. When one of these older engines gets out on the road ahead of one of the modern engines, how long will it be until the modern engine runs up to a red signal? And when the block goes clear the modern engine will only get started good when he will be **"STABBED AGAIN."**

At the end of the month it will be found that the mileage for the modern engines has dropped—they have cost just as much to operate if not more—but the mileage will first drop to 10,000 miles, then 9,000, then probably to 8,000 or less, all depending on how many of the older engines have been put in service.

Certainly, all the engines are hauling their trains, all working fine, and as far as the older engines are concerned they probably will be doing just as well as when they were new—however, the science of railroading has changed materially since these engines were first put in operation.

But, considering the amount of traffic being handled, how much money will the railroad be earning?

We wonder if it is recognized that these older engines, with their lower capacity and greatly reduced operating speed, will more and more every-day tend to bring the earning power of the modern engine nearer and nearer to their own level?

Isn't such a situation, which is almost sure to happen, serious enough to deserve a great deal of thought at present?

MOTIVE COMPANY

NEW YORK CITY

offered to the public at 100 and accrued interest, to yield 6 per cent are noncallable and mature on March 15, 1942. The conversion feature in connection with this issue provides for conversion at the option of the holder at any time during that period beginning September 15, 1932 and terminating September 15, 1937, into shares of the ordinary capital stock of the company, in the ratio of 4 shares of the par value of $25 each to each $100 principal amount of the bonds.

CAROLINA & NORTHEASTERN RAILWAY.—*Acquisition.*—This company, organized to take over the property of the Carolina & Northeastern Railroad at a receiver's sale, has applied to the Interstate Commerce Commission for authority to do so.

CHESAPEAKE & OHIO.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue such part of $28,142,000 of refunding and improvement mortgage 4½ per cent bonds, series C, heretofore authenticated, as may be necessary to be pledged as collateral to secure $9,000,000 of short term notes, the collateral not to exceed $125 of bonds, market value, for $100 of notes.

CHESAPEAKE & OHIO.—*I. C. C. Objects to Use of Credit To Purchase Stocks of Other Roads.*—The text of the report of Division 4 of the Interstate Commerce Commission of March 11, conditionally authorizing this company to pledge so much of an issue of $28,142,000 of refunding and improvement mortgage bonds as may be necessary as collateral for $9,000,000 of short-term notes, as made public on March 17, indicates that the purpose of the condition was to prevent the use of the bonds as collateral for notes issued in February in connection with the purchase from the Alleghany Corporation of 46,200 shares of Pere Marquette common stock at $11 a share, and as a deposit to secure a four-year option to purchase at $13.25 a share 215,000 shares of Erie common stock and 167,300 shares of New York, Chicago & St. Louis common stock. The pledge of the bonds was authorized on condition that no portion of them should be used as collateral for notes issued in respect of the purchase of or payment for, or in reimbursement of the treasury for, moneys expended in respect of the purchase of or payment for any stock or evidence of indebtedness of any other company. After referring to the issue in January of $3,950,658 of one-year 6 per cent notes in connection with the purchase of the stocks referred to the report says:

> The record fails to show whether the applicant intends to use as collateral for the foregoing notes any of the bonds which it is asking authority to pledge. The conservation of the credit of carriers is a matter of public interest, and, under existing conditions, we think it is proper to require that bonds issued be used only in connection with the provision of funds for keeping railway properties in operation, meeting fixed charges, and otherwise maintaining credit, and that the authorization granted herein should be restricted accordingly. It is our view that it was not the intent of Congress, in exempting short-term notes to a limited extent from the regulatory power, that carriers should restrict their freedom of action in short-term financing by borrowing for purposes other than those strictly germane to the maintenance and operation of their properties in interstate commerce.

DENVER & RIO GRANDE WESTERN.—*R. F. C. Loan.*—The Interstate Commerce Commission on March 21 approved a loan of $2,500,000 to this company from the Reconstruction Finance Corporation to enable it to meet interest requirements, maturities and taxes.

DETROIT & MACKINAC.—*Annual Report.*—The annual report of this company for 1931 shows net income after interest and other charges of $64,858, as compared with net deficit of $77,831 in 1930. Selected items from the Income Account follow:

	1931	1930	Increase or Decrease
RAILWAY OPERATING REVENUES	1,000,892	1,082,774	— 81,882
Maintenance of way	168,941	302,397	—133,456
Maintenance of equipment	170,249	196,820	— 26,571
Transportation	326,289	407,447	— 81,157
TOTAL OPERATING EXPENSES	734,866	959,901	—225,035
NET REVENUE FROM OPERATIONS	266,026	122,873	+143,153
Railway tax accruals	70,731	91,650	— 29,919
Railway operating income	195,065	31,192	+163,873
Equipment rents—Dr.	†3,542	†800	— 2,742
Joint facility rents—Dr.	†2,719	†2,709	— 9
GROSS INCOME	189,672	42,816	+146,855
Interest on funded debt	110,000	110,000	.....
NET INCOME	64,858	*77,830	+142,689

† Debit.
* Deficit.

FRANKFORT & CINCINNATI.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $50,000 to aid it in temporary financing.

HOBART SOUTHERN.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to acquire and operate a 6.4-mile line extending from Hobart Mills, Cal., to Truckee and to issue $36,000 of stock to be delivered at par to the Hobart Estate Company in payment for the railroad and $5000 of working capital.

KENTUCKY & INDIANA TERMINAL.—*R. F. C. Loan.*—The Interstate Commerce Commission on March 21 approved a loan of $800,000 to this company from the Reconstruction Finance Corporation to enable it to repay temporary advances by proprietary lines, and pay short term notes and vouchers for materials and supplies.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue a promissory note or notes for $2,990,173.

MOBILE & OHIO.—*R. F. C. Loan.*—This company applied to the Reconstruction Finance Corporation on March 18 for a loan of $1,000,000 to aid it in meeting cash requirements in the near future amounting to $2,034,452, including wages and payrolls due April 1 and various audited past due vouchers for materials and supplies and other accounts. The Interstate Commerce Commission on February 25 had approved a loan of $785,000 to this company to meet fixed interest obligations due February 1 and March 1 secured in part by an irrevocable order for that amount on the Railroad Credit Corporation.

PEORIA & PEKIN UNION.—*Annual Report.*—The annual report of this company for 1931 shows net income after interest and other charges of $39,131, as compared with net income of $269,962 in 1930. Selected items from the Income Statement follow:

	1931	1930	Increase or Decrease
RAILWAY OPERATING REVENUES	1,067,870	1,620,785	—552,915
Maintenance of way	139,818	250,478	—110,659
Maintenance of equipment	134,917	159,676	— 24,759
Transportation	558,475	726,666	—168,191
TOTAL OPERATING EXPENSES	978,700	1,295,430	—316,730
NET REVENUE FROM OPERATIONS	89,170	325.356	—236,186
Railway tax accruals	174,300	212,758	— 38,458
Railway operating income	* 85,130	112,598	—197,728
Joint facility rents	267,887	319,711	— 51,824
NET RAILWAY OPERATING INCOME	188.730	424,623	—235,892
Non-operating income	32,991	29,317	+ 3,674
GROSS INCOME	221,722	453,939	—232,218
Rent for leased roads	1,500	1,500	.....
Interest on funded debt	176,000	177,209	— 1,209
TOTAL DEDUCTIONS FROM GROSS INCOME	182,591	183,977	— 1,386
NET INCOME	39,131	269,962	—230,831

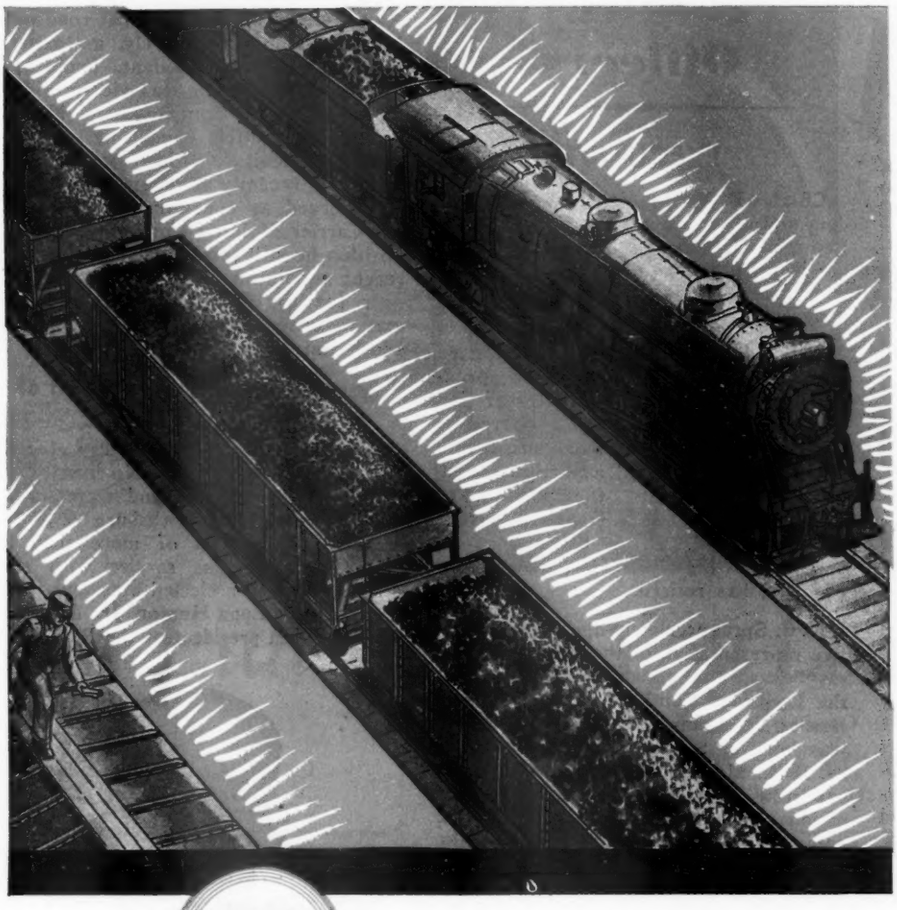
* Credit.

PRESCOTT & NORTH-WESTERN.—*Final Recapture Order.*—The Interstate Commerce Commission has issued a final report and order finding that this company earned excess income amounting to $14,095 for the year 1925 and ordering it to pay one-half the amount, $7,047, to the general railroad contingent fund.

READING.—*Equipment Trust Certificates.*—The Interstate Commerce Commission has authorized this company to sell $3,725,000 of equipment trust certificates held in its treasury to the highest bidder, at a price so that the yield will not exceed 6 per cent.

RICHMOND, FREDERICKSBURG & POTOMAC.—*Recapture Litigation.*—The supreme court of the District of Columbia has dismissed the application of the Richmond, Fredericksburg & Potomac for an injunction restraining J. R. McCarl, comptroller-general of the United States, from withholding payment of money due it for mail transportation for the federal government to apply on the $696,705 the Interstate Commerce Commission is attempting to recapture from the company as representing one-half its net earnings in excess of 6 per cent for the years 1922

Continued on Next Left Hand Page



WHEREVER CORROSION ATTACKS USE TONCAN IRON

Firebox sheets in bad water districts are now running far longer between shoppings—they are made of Toncan Iron. « Locomotive tender plates, attacked by wet coal-sulphuric acid corrosion from the coal bin and water-oxygen corrosion from the water compartment are now giving greater service—they, too, are made of Toncan Iron. « On coal cars, iron ore cars, and every other place where equipment is being heavily attacked by corrosion, Toncan Iron gives longer life. « Toncan Iron has the corrosion resistance which you naturally expect from good iron increased by the addition of copper and molybdenum. The resulting alloy resists corrosion better than any other material you have ever used.

Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Staybolts, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Nitralloy • Agathon Iron for pins and bushings • Agathon Staybolt Iron Climax Steel Staybolts • Upson Bolts and Nuts Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel (20-27 Carbon)

TONCAN COPPER Mo-lyb-den-um IRON

The Birdsboro Steel Foundry & Machine Company of Birdsboro, Penna., has manufactured and is prepared to supply under license, Toncan Copper-Molybdenum Iron castings for locomotives.

REPUBLIC STEEL CORPORATION

HEADQUARTERS: YOUNGSTOWN, OHIO

and 1923. The court held that the company was not entitled to an injunction on the ground that it had an adequate remedy to contest the commission's order on its merits. The company failed to pay the amount within the time set by the commission for its payment and the commission, instead of bringing suit for the amount, asked the comptroller general to withhold funds due the company.

SEABOARD AIR LINE.—*Receivers Certificates.*—The Interstate Commerce Commission has authorized the receivers of this company to issue $15,038,000 of receivers' certificates, $480,000 to be issued in payment for rail and tieplates, $4,000,000 to be exchanged for a like amount of outstanding receivers' certificates, Series A, and $10,558,000 to be exchanged for matured and maturing installments of equipment obligations.

SOUTHERN PACIFIC.—*Acquisition of Cotton Belt.*—The Interstate Commerce on March 23 made public an order dated March 14 extending for 30 days from March 14 the effective date of its order of January 12, in which it conditionally authorized this company to acquire control of the St. Louis Southwestern by purchase of a majority of its stock. The Southern Pacific has given notice of its willingness to accept the conditions provided the stock held by minority stockholders covered by options be deposited by the minority stockholders within 60 days after notice by the Southern Pacific in accordance with the terms of its offer for the exchange of stock. With the optioned stock it would have 86 per cent of the Cotton Belt stock.

TENNESSEE CENTRAL.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation and the Interstate Commerce Commission for a loan of $300,000 to meet interest due April 1, $102,300; take up a demand bank loan for $100,000; pay taxes due March 1, $42,717; and pay vouchers for materials and supplies that are past due.

WICHITA FALLS & SOUTHERN.—*Securities.*—The Interstate Commerce Commission has authorized this company to issue, reissue or renew outstanding short term notes for $800,000 and to pledge as collateral security therefor $2,021,000 of first mortgage and collateral lien 5 per cent bonds.

Average Prices of Stocks and of Bonds

	Mar. 22	Last week	Last year
Average price of 20 representative railway stocks..	29.09	28.57	87.26
Average price of 20 representative railway bonds..	69.10	70.15	93.26

Dividends Declared

Baltimore & Ohio.—No Action taken on Preferred dividends.

Kansas City Southern. — Preferred, $1.00, quarterly, payable April 15 to holders of record March 31.

Norfolk & Western.—Adjustment Preferred, $1.00, quarterly, payable May 19 to holders of record April 30.

Railway Officers

EXECUTIVE

Charles D. Young, assistant vice-president and general purchasing agent of the Pennsylvania, has been appointed vice-president in charge of purchases, stores, and insurance, succeeding **M. C. Kennedy,** who retires on April 1.

L. O. Head, vice-president, Western departments, of the Railway Express Agency, Inc., with headquarters at San Francisco, Cal., has been transferred to Chicago, where he will have jurisdiction over the Western and a portion of the Central departments, the position of vice-president at San Francisco having been abolished. **E. A. Stedman,** vice-president of the Central departments, at Chicago, has retired.

L. C. Sprague, newly-appointed executive representative of the Missouri-Kansas-Texas, and consulting engineer of the Louisiana Southern, with headquarters at St. Louis, Mo., and New York, was born at Serena, Ill., on September 29, 1885. Mr. Sprague received his education at night school and at the International Correspondence Schools. He commenced his railroad career in the service of the Chicago, Burlington & Quincy in 1899, and was connected with that road until 1910, serving successively as call boy, operator, fireman and engineman. From 1910 to 1912, he served as mechanical and airbrake instructor with the International Correspondence Schools. In 1912, he undertook the position of supervisor of airbrakes with the Great Northern, and, in 1915, he became general motive power inspector with the Baltimore & Ohio. From 1918 to 1920, Mr. Sprague was engaged as sales manager with the Chicago Pneumatic Tool Company. On the latter date he became engaged in the building business, but re-entered the railroad field in 1923, as superintendent, with the Uintah Railway, continuing with that road until 1929, serving successively as general manager and vice-president. From 1929 to 1931, Mr. Sprague was vice-president of the Dardelet Company, and in 1931 he was appointed consulting engineer for the Wichita North-Western, which duties he recently relinquished. He has also served as consulting engineer for the Carrier Holding Corporation, which position he still retains in addition to his recent appointments as consulting engineer for the Louisiana Southern and executive representative for the Missouri-Kansas-Texas.

L. C. Sprague

Norman Call Elected President of R. F. & P.

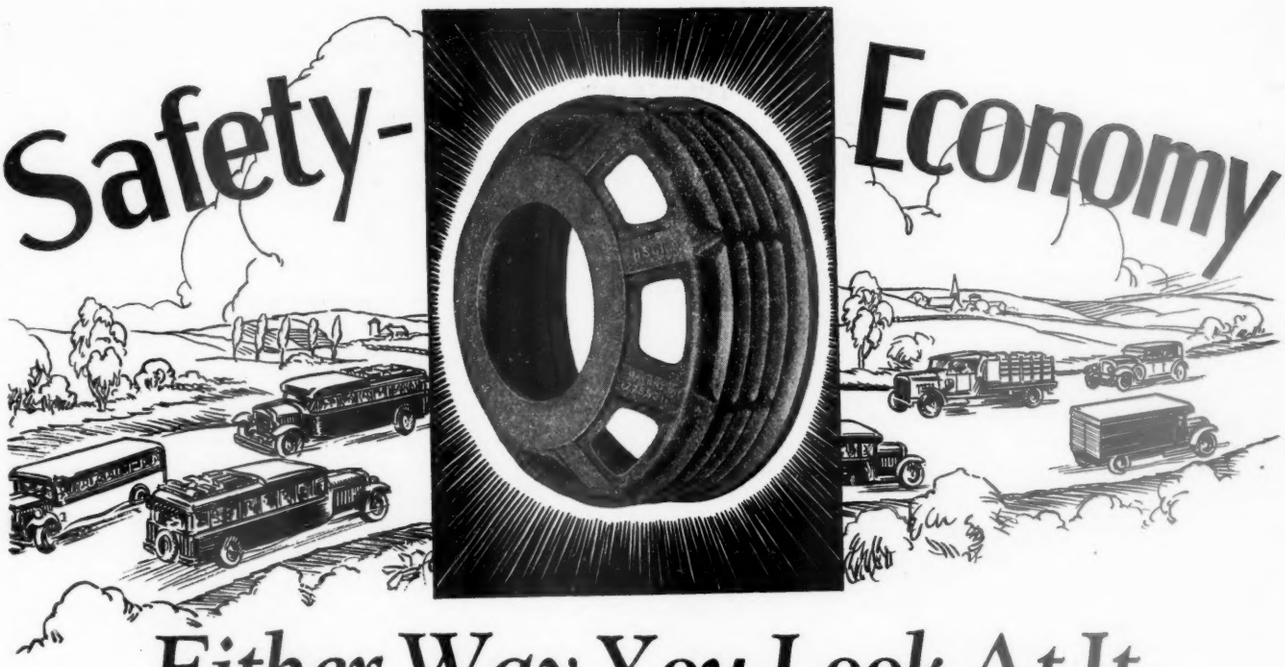
As announced in the *Railway Age* of March 19, page 509, Norman Call, formerly vice-president and secretary of the Richmond, Fredericksburg & Potomac, with a record of more than 30 years of continuous service with that company, has been elected president. Mr. Call succeeds Eppa Hunton, Jr., deceased, who had been president of the R. F. & P.

Norman Call

since 1920, and whose career was outlined in the *Railway Age* of March 19.

Born in Richmond, Va., on March 29, 1880, and educated at the Richmond high school and in night courses of the Virginia Mechanics' Institute, Mr. Call began his business career in 1897, as a clerk in the purchasing department of the Richmond Locomotive Works (now part of the American Locomotive Company). Three years later, in 1900, he was placed in charge of the purchasing department, but left the locomotive company's service after a single year in this position to enter the employ of the Richmond, Fredericksburg & Potomac, with which company he has since been continuously connected. For nine years from 1901 to 1910 he served as secretary to the president of that railroad, and from 1910 to 1917 as secretary of the company. In 1917 he was appointed assistant to the president, and, in 1920, secretary and vice-president of the company, with headquarters at Richmond. It was this position which he was holding at the time

Continued on Next Left Hand Page



Either Way You Look At It

FROM the standpoint of safety, it must be admitted that *good brakes* are one of the most important factors in the operation of automotive equipment.

Safety is, therefore, one of the two major reasons why your busses and trucks should be equipped with Brake Drums made of HUNT-SPILLER *Air Furnace* GUN IRON. They always retain that smooth wearing surface which insures maximum braking efficiency and positive control.

From the standpoint of *economy* you cannot afford to pass up the savings offered by the use of HUNT-SPILLER *Air Furnace* GUN IRON Brake Drums.

Their smooth, wear-resisting properties insure maximum service, greater mileage from the brake lining, fewer adjustments and less time in the repair shop. The savings in maintenance costs alone justify complete standardization.

HUNT-SPILLER MFG. CORPORATION
J. G. Platt, Pres. & Gen. Mgr. V. W. Ellet, Vice-President

Office & Works
383 Dorchester Ave. South Boston, 27, Mass.

Canadian Representative: Joseph Robb & Co., Ltd., 997 Aqueduct St., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co. 30 Church Street, New York, N. Y.

HSGI
Reg. U. S. Trade Mark

Brake Drums
Cyl. Replacement Sleeves
Clutch Plates
Pistons

HUNT-SPILLER GUN IRON
Air Furnace

of his recent election to the presidency of the R. F. & P.

In addition to his railroad duties, Mr. Call is also secretary and vice-president of the Richmond, Fredericksburg & Potomac Transportation Company, the highway subsidiary operated by the R. F. & P.; secretary of the Richmond Terminal Railway; and a director of the Richmond Terminal Railway Company, the Richmond, Fredericksburg & Potomac Transportation Company, and the Fruit Growers' Express Company.

OPERATING

The jurisdiction of **F. S. Risley,** superintendent, Mohawk division, New York Central, has been extended to include the property of the Troy Union Railroad.

E. H. Buhlman, general superintendent of the Western district of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., has had his jurisdiction extended to include the entire system, effective April 1, following the election of **Albert N. Williams,** general superintendent of the Eastern district, as president of the Chicago & Western Indiana and the Belt Railway of Chicago, as noted in the *Railway Age* for March 12.

ENGINEERING AND SIGNALING

The jurisdiction of **B. H. Prater,** chief engineer of the Oregon Short Line, with headquarters at Salt Lake City, Utah, has been extended over engineering and maintenance matters on the Los Angeles & Salt Lake and Oregon-Washington Railroad & Navigation units of the Union Pacific System. **R. L. Adamson** and **S. Murray,** chief engineers of the L. A. & S. L. and the O.-W. R. R. & N., with headquarters at Los Angeles, Cal., and Portland, Ore., respectively, will continue in direct charge of such matters on these lines.

MECHANICAL

R. V. Blocker, assistant superintendent of motive power on the Erie, has moved his headquarters from Hornell, N. Y. to Cleveland, Ohio.

J. F. Kane, master mechanic of the Erie at Susquehanna, Pa., has been appointed master mechanic of the Wyoming and Jefferson divisions, with headquarters at Avoca, Pa., and his former position, as well as the positions of master mechanic at Port Jervis, N. Y., and assistant master mechanic at Avoca, Pa., have been abolished.

SPECIAL

Following the consolidation of the Eastern and New York districts of the Erie, **L. McGuill,** chief of police of the New York district, has had his jurisdiction extended over the Eastern district, with headquarters as before at Jersey City, N. J.

OBITUARY

Ashley T. Hamilton, assistant superintendent of the Nashville terminals of the Louisville & Nashville, at Nashville, Tenn., died on February 22.

T. W. Cheatham, superintendent of the Eastern division of the Missouri Pacific, with headquarters at Jefferson City, Mo., who had been on a leave of absence since January 21, 1930, died on February 20 at St. Louis, following a long illness.

Albert E. Brainard, formerly passenger traffic manager of the New York Central, died on March 22, at his home in New York. Illness compelled Mr. Brainard to resign his position on January 16, and his death was caused by a complication of maladies. He was 65 years old. Mr. Brainard had entered the service of the N.Y.C., in 1887, as a stenographer, and had been advanced through various positions in the traffic department until he was appointed passenger traffic manager in June, 1931. A photograph and biographical sketch of his career appeared in *Railway Age,* issue of June 20, 1931, page 1222, in connection with that appointment.

Charles H. Banks, formerly auditor of disbursements of the Central of Georgia and the Ocean Steamship Company of Savannah, died at his home in Denver, Colo., on February 25, 1932. Mr. Banks was born at Charleston, S. C., December 23, 1866. He entered the service of the Ocean Steamship Company of Savannah at the port agency at Savannah about 1890, and after serving in various capacities, was appointed auditor of the Ocean Steamship Company of Savannah in 1896. When the accounting department of the Ocean Steamship Company of Savannah was consolidated with that of the Central of Georgia, he became chief clerk to the auditor, continuing in that capacity until July 1, 1903, when he was appointed auditor of disbursements. He remained in that position until his resignation in 1914.

W. F. Sheridan, who retired on March 1, 1931, as superintendent of the Louisville division of the Louisville & Nashville, died on February 24, after a long illness. Mr. Sheridan was born on March 26, 1866, at Newark, Ohio, and first entered railway service as a messenger on the Baltimore & Ohio. He entered the service of the Louisville & Nashville in 1890 as a train dispatcher and later served as chief dispatcher and master of trains. For four years, beginning with 1903, Mr. Sheridan was superintendent of transportation of the National Railways of Mexico, at the end of which time he returned to the Louisville & Nashville as inspector of transportation. He was promoted to assistant superintendent of transportation in 1913 and four years later he was appointed superintendent of the Louisville division.

Garret H. Wilson, superintendent of the Hudson, Harlem and Putnam divisions of the New York Central, with headquarters at New York, died at his home in Mt. Vernon, N. Y., on March 21. Mr. Wilson was born on May 19, 1867, at Lambertville, N. J. He received a public school education and entered railway service on March 6, 1884, as a telegraph operator for the Pennsylvania. On May 31, 1885, he undertook a similar position with the Central of New Jersey, and subsequently served as yardmaster and train dispatcher on that road. He entered the service of the New York, New Haven & Hartford on September 6, 1887, as a train dispatcher, and later

Garret H. Wilson

served as chief dispatcher and superintendent. In June, 1905, Mr. Wilson became engaged in other business, but reentered railroad service in January, 1907, with the Boston & Albany, as a dispatcher. The following month he went to the New York Central as chief dispatcher, electric division, and Grand Central Terminal, and subsequently was advanced to assistant superintendent and superintendent, with jurisdiction over the same territory. In November, 1924, Mr. Wilson was appointed superintendent of the Hudson division, and, since 1930, he had also served as superintendent of the Harlem and Putnam divisions.

THE NEW ENGLAND SHIPPERS' ADVISORY BOARD held its regular meeting at Boston on March 16. The reports of commodity committees indicate a probable decrease in traffic for the second quarter of 1932 of about 7.9 per cent as compared with the second quarter of last year. In boots and shoes an increase of 15 per cent is expected; in pumps, tanks and boilers 40 per cent, and in sugar 5 to 10 per cent. Smaller increases are expected in cement, explosives and packing house products, but the increases are more than offset by the expected decreases, the more important of which are: coal and coke 15 to 20 per cent; cordage 15 per cent, fertilizer 25 per cent, furniture 10, grains 10, iron and steel 30, lime and plaster 20, livestock 20, lumber 15, paper and pulp 10, roofing materials 10, and scrap metals 15 per cent. W. F. Garcelon was re-elected general chairman.